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AIRCRAFT NOISE DEFINITION. PHASE II. ANALYSIS OF FLYOVER-NOISE DATA FOR THE DC-8-61 AIRCRAFT

R. E. DeLapp

Douglas Aircraft Company

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PHASE II
ANALYSIS OF FLYOVER-NOISE DATA FOR THE DC-8-61 AIRCRAFT

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R. E. DeLapp
Douglas Aircraft Company
McDonnell Douglas Corporation
3855 Lakewood Blvd, Long Beach, California 90846

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16. Abstract

Phase II of the "Aircraft Noise Definition" program consisted of a DC-8-61 flight test program with an objective to improve the statistical accuracy of the noise data reported in Phase I of the program and to broaden the data base to include measurements at long distances and at a thrust required for a steep approach. Noise measurements were made during flyovers up to an altitude of 8000 feet, at sideline distances up to 8000 feet and at target thrusts of 15,000, 10,000, 5000, 3200, and 2000 pounds. This document reports the data acquisitions, the analysis procedure, and the results in terms of variations in reference-day EPNL and A-weighted sound level with slant range; overhead to sideline noise level relationship; and data showing lateral noise attenuations. Data accuracy is described in terms of assignable confidence limits. A comparison was made between reference-day noise levels determined for surface weather conditions and by a method that accounts for upper-air variations in the sound-path weather. A method that adjusts for lateral noise attenuation in computing EPNL's for sideline locations was suggested.

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ABBREVIATIONS AND SYMBOLS

EPNL	Effective perceived noise level
EPNdB	Unit of effective perceived noise level
FAR	Federal Aviation Regulations
PNLTM	Maximum tone corrected perceived noise level
PNdB	Unit of perceived noise level or tone-corrected perceived noise level
P	Sound pressure
SPL	Sound pressure level, decibels or dB
EPR	Engine pressure ratio
rms	Root mean square
N_1	First fan stage rotational speed, rpm
$N_1/\sqrt{\theta_{T_2}}$	First fan stage referred speed, rpm
θ_{T_2}	Ratio of total temperature at fan stage face to standard sea level reference temperature of 518.7° Rankine
F_N	Net thrust, pounds
F_N/δ_{amb}	Referred net thrust, pounds
δ_{amb}	Ratio of ambient pressure to standard sea level reference pressure of 29.92 inches of mercury
I	Sound intensity
M	Mach number
V_S	Stall speed, knots
V_2	Second segment airspeed defined by FAA, knots
°F	Degrees Fahrenheit
RH	Relative humidity, percent
c	Speed of sound, ft/sec
q	Dynamic pressure, lb/ft²
ρ	Density, slugs/ft³
KEAS	Knots equivalent airspeed
KIAS	Knots indicated airspeed
KTAS	Knots true airspeed
C_D	Coefficient of drag

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C_{D_G}	Coefficient of drag for landing gear
C_{D_O}	Coefficient of drag at zero lift
C_{D_I}	Induced drag coefficient
C_L	Coefficient of lift
W	Gross weight, pounds
P_{T_2}	Engine inlet total pressure, psi
P_{T_7}	Engine core outlet total pressure, psi
T_{T_7}	Engine core outlet total temperature, °F
ADDS	Aircraft digital data system
FDC	Flight data center
CISA	Controlled integrating spectrum analyzer
OCUM	Designation for magnetic tape recording of the binary, fixed-length record of a flyover-noise measurement
TMERGE	Designation for magnetic tape recording of four binary, fixed-length records for each flyover. Includes OCUM tape record and three aircraft performance records.
CPA	Closest point of aircraft
β	Elevation angle of aircraft above ground level

SECTION 1
INTRODUCTION

The growth in commercial jet transport operations has brought an increase in aircraft noise great enough to be considered as an environmental problem to the surrounding airport communities. In response to Federal legislation dealing with the community impact of aircraft noise, the Federal Aviation Administration (FAA) is conducting comprehensive studies of the definition of aircraft noise. In support of the study objectives, the Douglas Aircraft Company, McDonnell Douglas Corporation, is engaged in an FAA-sponsored Aircraft Noise Definition Program. The program requires that Douglas provide graphic and computerized acoustic and performance data on selected aircraft that are in current fleet operations. The program objectives are to be developed in three phases: Phase I, Analysis of Existing Data; Phase II, Minimum Data Acquisition Program; and Phase III, Expanded Data Acquisition Test Program Plan. This report is a documentation of the results of flyover-noise testing of a Douglas DC-8-61 aircraft for the Phase II portion of the program.

The results of the Phase I analysis of existing Douglas DC-8, DC-9, and DC-10 aircraft flyover-noise data were reported in Reference 1. Certain techniques used in the analysis of the Phase II data were developed for Phase I, reported in Reference 1, and are therefore, in most instances, referenced rather than repeated.

Under Phase II, flyover-noise levels for specified combinations of aircraft performance and altitude for the DC-8-61 were measured and analyzed for a "minimum data acquisition program" with an objective to improve the existing data base and increase confidence levels in areas found to be deficient in the Phase I study. Also of interest is the variation of noise level with distance to the sideline from the aircraft flight path.

Presented in this report are detailed descriptions of the test conditions, the flyover-noise measurement system, and the data processing and analysis. The results of the data analysis are summarized, the data accuracy is discussed, and the 90-percent limits of confidence determined. In addition,

revisions of the computer program listings for acoustic-data computations, developed and reported in Phase I, are included in the appendixes to this report.

The effects of considering the variations in upper-air temperature and relative humidity on the propagation of the flyover-noise were studied with comparisons made between noise spectra adjusted on the basis of surface weather and a layered weather technique.

A suggested method to be used in the determination of sideline noise levels is also presented.

SECTION 2

TEST DESCRIPTION

Flyover-noise tests were conducted with a Douglas DC-8-61 aircraft at Yuma International Airport, Arizona. The tests consisted of level flights, and simulated take-off and approach flyovers as listed in Table 1, with flight profiles as shown in Figure 1. Microphones, space positioning, meteorological, and associated data recording systems were located as shown in Figure 2.

The tests were conducted during the evening and early morning hours of November 6 - 8, 1973. The time of day for each test run is given in Table 1.

This section describes the test aircraft, site, and data acquisition equipment used during the tests.

2.1 AIRCRAFT CONFIGURATION

The test aircraft was a Douglas DC-8-61 aircraft, Fuselage No. 373, FAA Registration No. N8087U, a commercial transport powered by four Pratt and Whitney JT3D-3B turbofan engines, equipped with production nacelles. The aircraft was leased from United Air Lines for the period of these flyover tests. Figure 3 is a three view of the DC-8-61 aircraft, showing the gross dimensions, location of the engines, the ILS glideslope antenna, and the laser tracking targets used for aircraft space position determination during the flyovers.

The aircraft systems configurations for these tests were pneumatic and hydraulic systems NORMAL, auxiliary power unit OFF, landing lights ON, and the landing gear extended for all runs. The aircraft gross weight and flap and landing gear position for each run are listed in Table C-1 of Appendix C.

TABLE 1
AIRCRAFT NOISE DEFINITION – PHASE II
DC-8-61 FLYOVER-NOISE MEASUREMENTS

RUN	DATE TIME	TARGET THRUST F_N/δ	TYPE OF FLYOVER	HEIGHT OVER MICROPHONE ft	FLIGHT PROFILE (FIG. 1)
1	11-7-73 0203	15000	FULL POWER TAKEOFF	1180	E1
2	0214	15000	FULL POWER TAKEOFF	1200	E2
3	ABORT		LEVEL	–	–
4	NO TRACKING		LEVEL	5080	F1
5	0242	15000	LEVEL	5000	F2
6	0253	15000	LEVEL	8030	F3
7	0303	10000	LEVEL	8060	F4
8	0315	10000	LEVEL	5080	I3
9	0327	10000	LEVEL	8000	H1
10	0340	10000	LEVEL	8000	K1
11	11-7-73 2338	15000	FULL POWER TAKEOFF	1120	E1
12	2348	10000	REDUCED THRUST TO	800	G1
13	2358	10000	REDUCED THRUST TO	900	G2
14	ABORT	–	REDUCED THRUST TO	–	–
15	11-8-73 0017	10000	REDUCED THRUST TO	900	G3
16	0032	2000	REDUCED THRUST APPR	1320	H1
17	0043	2000	REDUCED THRUST APPR	1400	H2
18	0050	2000	REDUCED THRUST APPR	1320	H3
19	0100	5000	APPROACH	1060	K1
20	0110	5000	APPROACH	1100	K2
21	0116	5000	APPROACH	1100	K3
22	0126	15000	FULL POWER TAKEOFF	580	I1
23	0138	15000	FULL POWER TAKEOFF	600	I2
24	0148	15000	FULL POWER TAKEOFF	2200	I3
25	0158	15000	FULL POWER TAKEOFF	2150	I4
26	0210	5000	LEVEL	2400	J1
27	0220	5000	LEVEL	2470	J2
28	0234	15000	LEVEL	5360	F1
29	0245	10000	LEVEL	5080	F6
30	0255	10000	LEVEL	6000	[illegible]
31	0308	10000	LEVEL	8000	F8
32	0317	10000	LEVEL	8000	F9
33	0330	5000	LEVEL	5020	J3
34	0340	5000	LEVEL	5000	J4
37	0412	3200	LEVEL	380	M1
38	0420	3200	LEVEL	340	M2

NOTE:

TAKEOFFS – STARTED FROM LEVEL FLIGHT, SIMULATED AFTER ARRIVAL AT A SELECTED POINT OVER RUNWAY

- FULL POWER TAKEOFF (RUNS 1, 2, 5, 6, 11 AND 22-25) – RATED TAKEOFF ENGINE PRESSURE RATIO MAINTAINED
- REDUCED THRUST TAKEOFF (RUNS 12, 13 AND 15) – POWER ADJUSTED FOR SPECIFIED ROTOR SPEED WITH CLIMBOUT AT PRESCRIBED AIRSPEED

APPROACH POWER – MAINTAINED UNTIL END OF RUN ARRIVAL AT SELECTED POINT OVER RUNWAY, CONTINUED LEVEL UNTIL CLEAR OF AREA

- APPROACH (RUNS 19, 20 AND 21) ROTOR SPEED MAINTAINED TO MINIMIZE FAN NOISE VARIATIONS
- REDUCED THRUST APPROACH (RUNS 16, 17 AND 18) – THRUST ASSOCIATED WITH HIGHER ANGLE GLIDESLOPE

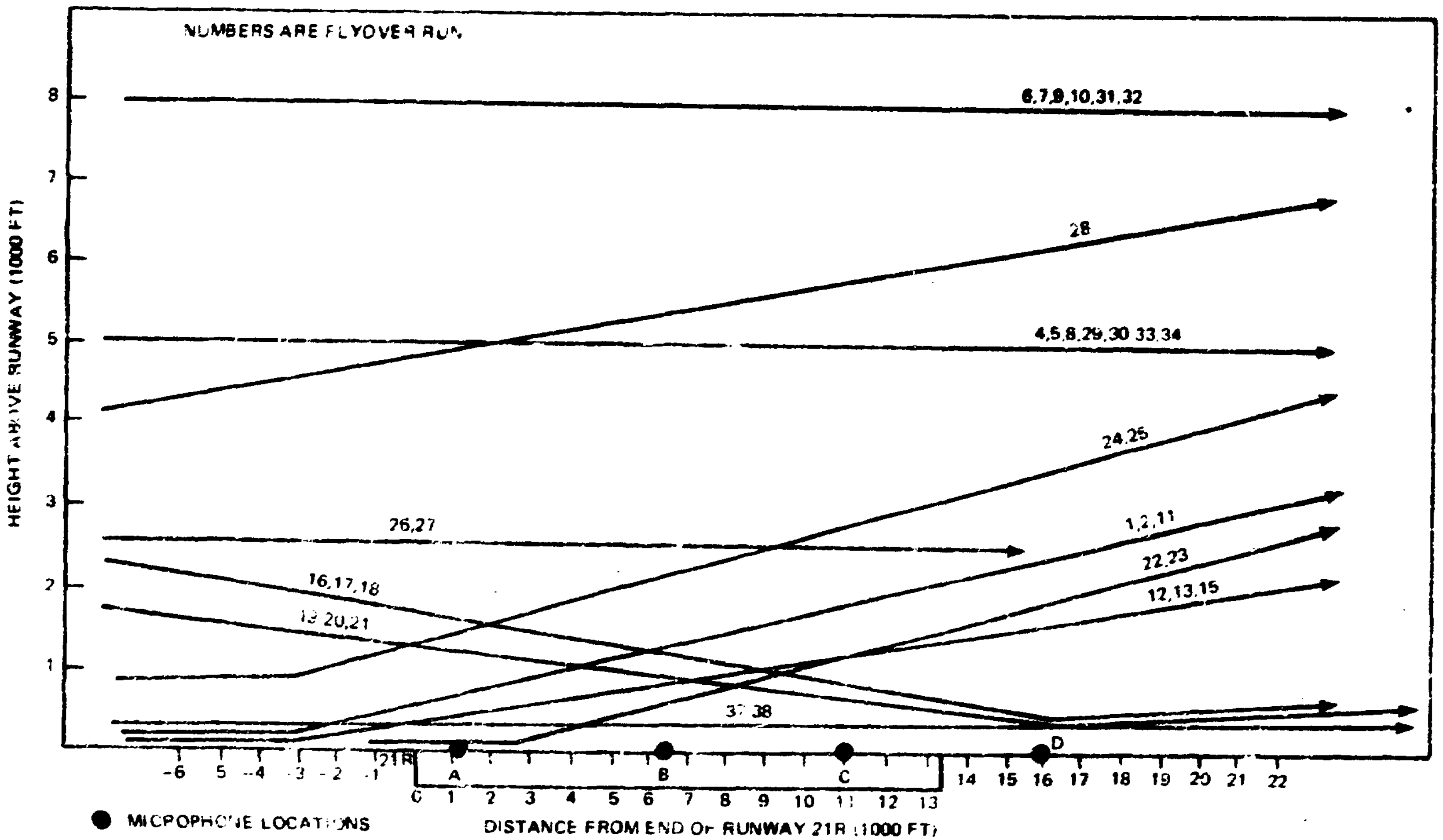

FIGURE 1. AIRCRAFT NOISE DEFINITION – DC-8-61 FLYOVER FLIGHT PROFILES

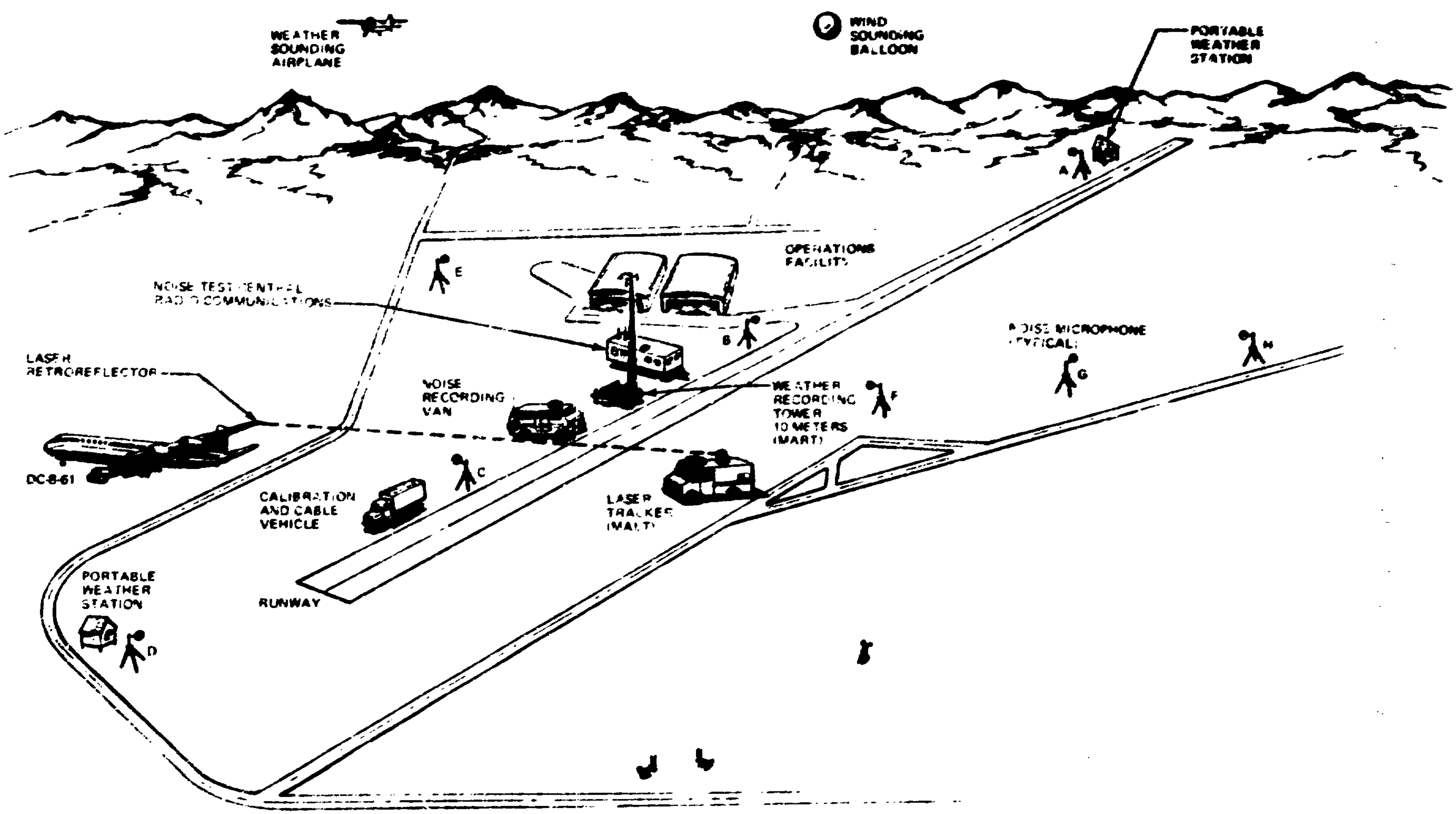

FIGURE 2. AIRPLANE FLYOVER NOISE MEASUREMENT SYSTEMS

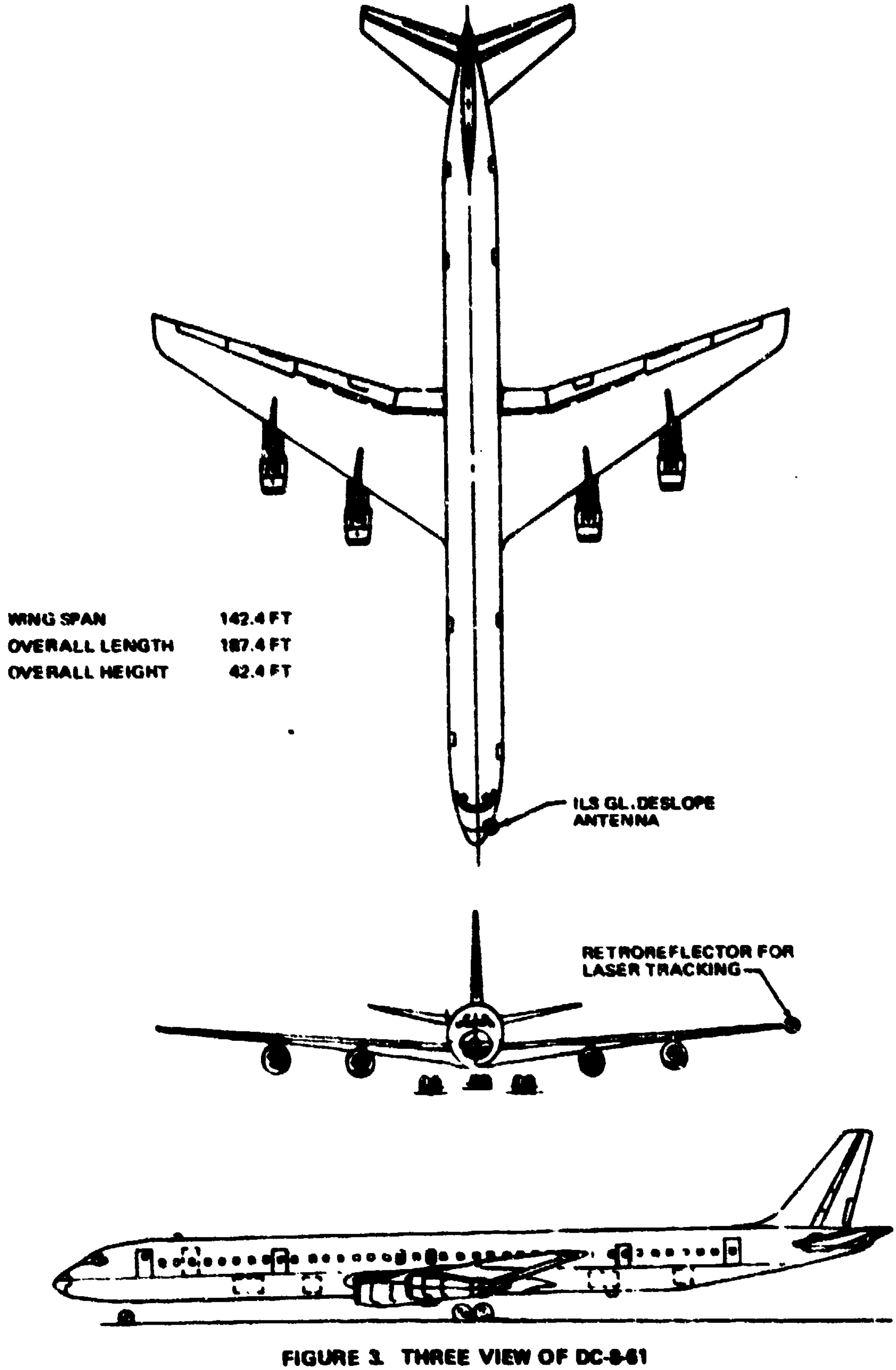

FIGURE 3. THREE VIEW OF DC-8-61

2.2 TEST SITE DESCRIPTION

The flyover-noise tests were conducted at the Yuma International Airport, Yuma, Arizona. The general topography of the test site and the location of the instrumentation systems are shown in Figure 4.

The natural surfaces are sandy soil having various degrees of compaction, with loose compaction predominating. The in situ surfaces adjacent to all test microphones were spaded in a random pattern to assure consistent surface conditions for all microphones, and also eliminate the possibility of excessive surface absorption at any of the measurement locations.

There were no obstructions, for example, trees, buildings, hills, or cliffs at any measurement point which were in violation of the 75-degree half-angle requirements. The terrain was not perfectly flat at all measurement points; however, it was acceptable for the purposes of acoustical measurements.

Climatological data for surface weather conditions at Yuma were compiled by National Weather Corporation for the month of November over a 14-year period. The data sources were (1) U.S. Air Force Revised Uniform Summary of Surface Weather Conditions (1950-1960) and (2) Environmental Science Service Administration climatological data for Yuma, Arizona (1960-1972). A summary of the frequency of occurrence of the surface weather conditions of wind, temperature, and relative humidity that are within FAR Part 36 limits as a function of calendar month is given in Figure B-1 of Appendix B.

A summary of temperature-inversion characteristics as a function of calendar month is given in Figure B-2 of Appendix B.

FIGURE 4. TOPOGRAPHIC MAP OF YUMA FLYOVER TEST SITE

Measured surface temperatures, relative humidities, wind speeds, and wind directions for the periods of the test aircraft flyovers are summarized in Table B-1 and Figure B-3 of Appendix B. Plots of the continuous recordings of the associated upper-air sound-path weather data are given in Figure B-4 of Appendix B.

All surface-weather measured data were within the FAR Part 36 limits of 41 to 86° Fahrenheit temperature; 30- to 90-percent relative humidity; and 0- to 10-knot wind speed.

2.3 FLYOVER-NOISE MEASUREMENT SYSTEM

The Douglas Aircraft Company has designed and developed a variety of special equipment and data instrumentation systems to meet requirements of the various acoustical tests conducted. Over the past 4 years Douglas has designed, developed, implemented (in an incremental fashion), and operated, at high utilization rates, a comprehensive state-of-the-art aircraft-noise measurement system described below. The subsystems used to acquire the required data during aircraft flyover noise testing are grouped into four categories; that is, those for acoustical, meteorological, space-positioning, and airplane operating parameters. These subsystems are shown in Figure 5.

2.3.1 Acoustical Parameters

The flyover-noise data acquisition system is shown in Figures 2, 5, and 6. The control portion of the system is housed in the mobile sound-recording van shown in Figure 5.

Eight of the nine microphones were tripod-mounted with the microphone cartridges 4 feet above the ground and oriented such that the flyover noise impingement on the microphone diaphragm was at approximately grazing incidence throughout the noise recording. The ninth microphone was flush-mounted (Figure 7). All microphones (except the flush-mounted) were fitted with windscreens for all tests. High-frequency preemphasis was utilized during recording of approach and takeoff noise tests. For each noise recording, the gain settings on the signal-conditioning amplifiers were set

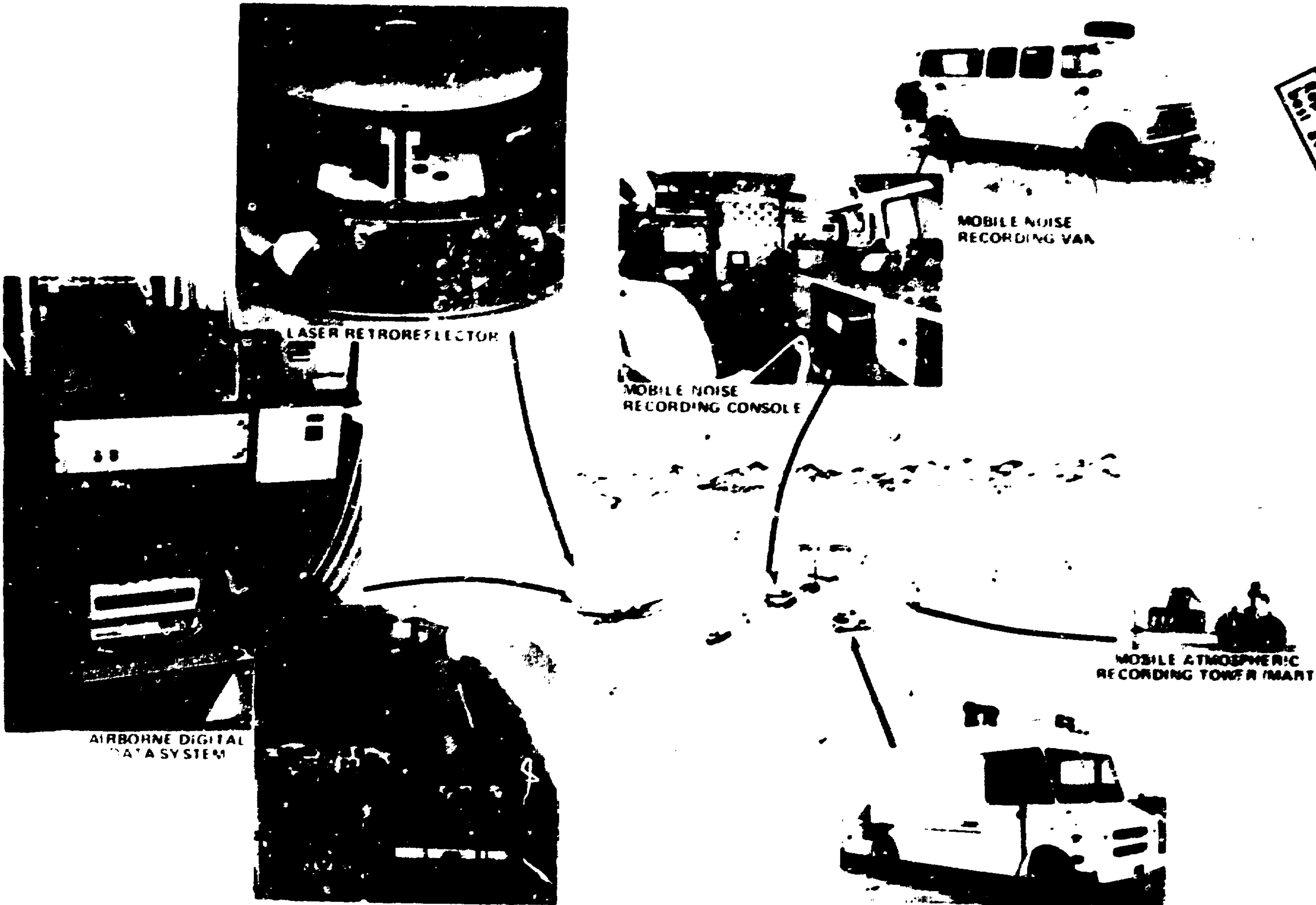

FIGURE 5. AIRPLANE FLYOVER – NOISE MEASUREMENT SYSTEMS

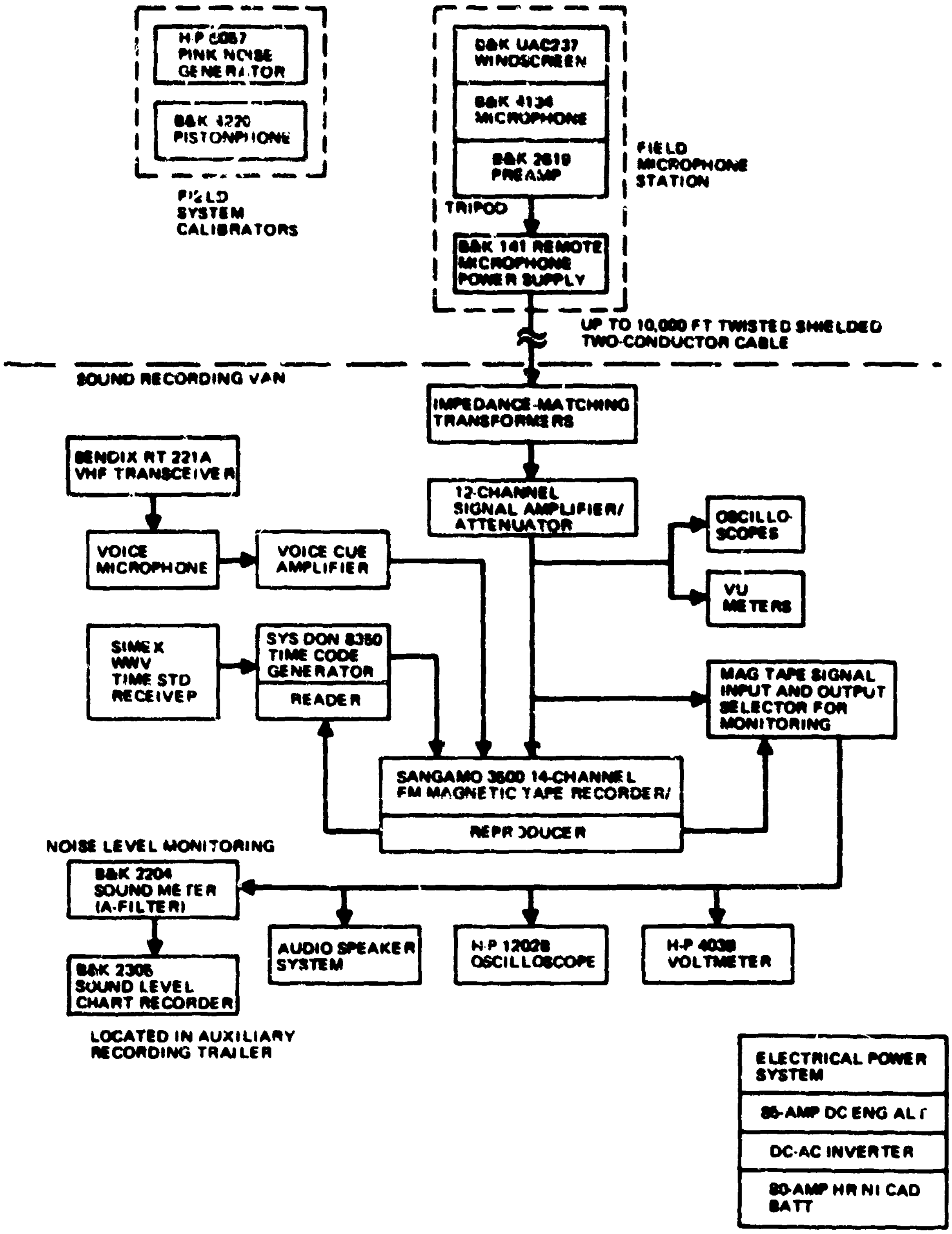

FIGURE 6. FLYOVER NOISE DATA ACQUISITION SYSTEM

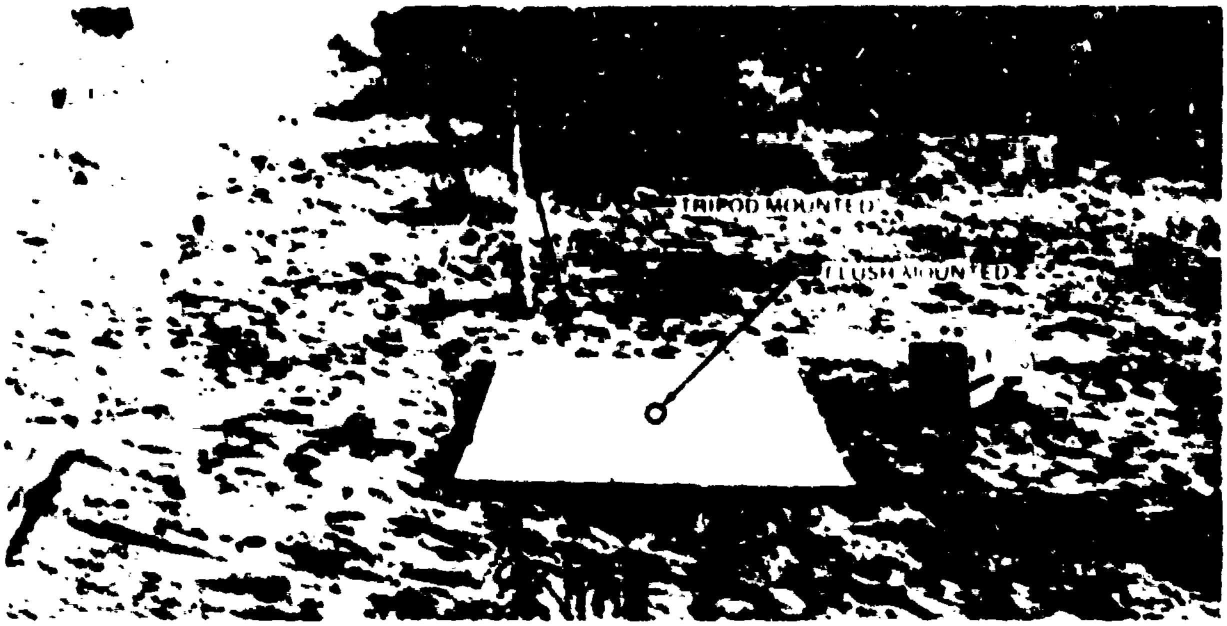

FIGURE 7. MICROPHONE INSTALLATIONS

to obtain optimum signal-to-noise ratios for optimum dynamic recording range on the magnetic tape. The flyover-noise data were recorded on a 14-channel intermediate-band FM recorder operating at 30 inches per second. In addition, the time of day (IRIG-B code) synchronized to the standard time broadcast by radio station WWV (National Bureau of Standards) was recorded on a separate tape channel, along with each flyover-noise recording. A dynamic system calibration with a reference sound pressure level was recorded in the field with a piston-phone that generates a sound pressure level of 124.0 $\pm$ 0.2 dB at 250 Hz. Frequency-response calibration signals of the recording system (excluding microphone cartridge) were recorded. The signals consisted of a 90-second recording of broadband "pink" noise generated by a precision pseudo-random noise generator with a noise period of 2.2 seconds.

Immediately before or after each flyover-noise measurement, a recording was made of the ambient noise levels, with the same system gain setting as was used for the flyover recording.

2.3.1.1 Psuedotone Correction - Flyover noise was measured with a flush-mounted microphone located at ground level in close proximity to one of the tripod-mounted noise measurements locations (Figure 7). The primary

objective of measuring flyover noise with this microphone was to establish the presence or absence of low-frequency pseudotones in measured flyover-noise spectra due to ground-reflection phenomena. A discussion of pseudotones and their significance is contained in Appendix D.

2.3.2 Aircraft Operation Parameters

The definition of flyover-noise levels for specific aircraft operation parameters required the monitoring and recording of (1) airplane flight conditions, (2) propulsion-system operation, and (3) airplane systems configuration. The parameters considered necessary to be recorded for the flight-test program are as listed in Table C-1 of Appendix C.

The flight-test aircraft was equipped with an Airborne Digital Data System (ADDS) (Figure 8), cameras focused on the pilot instrument panel and flight engineer panel (cockpit cameras) and other visual cockpit indicators (flight-card recording) (Figure 9). The ADDS uses both analog and digital transducers and includes signal conditioning, analog-to-digital conversion, and multiplexing to record all data on one tape track of a direct wide-band 1-inch recorder. Elapsed time was obtained by recording output signals of a time code generator on the data tape using the IRIG-B code.

Calibrated instruments were used to obtain the aircraft-system data listed in Table C-1.

2.3.3 Meteorological Parameters

Meteorological data, particularly temperature and relative humidity, are required to determine the attenuation of flyover noise due to atmospheric absorption and to correct the measured SPL's to standard or reference-day weather conditions.

2.3.3.1 Surface Weather Conditions - Flyover-noise meteorological equipment includes a 10-meter Mobile Atmospheric Recording Tower (MART) system with temperature, relative-humidity, and wind-velocity recorders, and is trailer-mounted and towed by the acoustics van (see Figure 5). Surface weather-sensing and -recording equipment includes two small portable

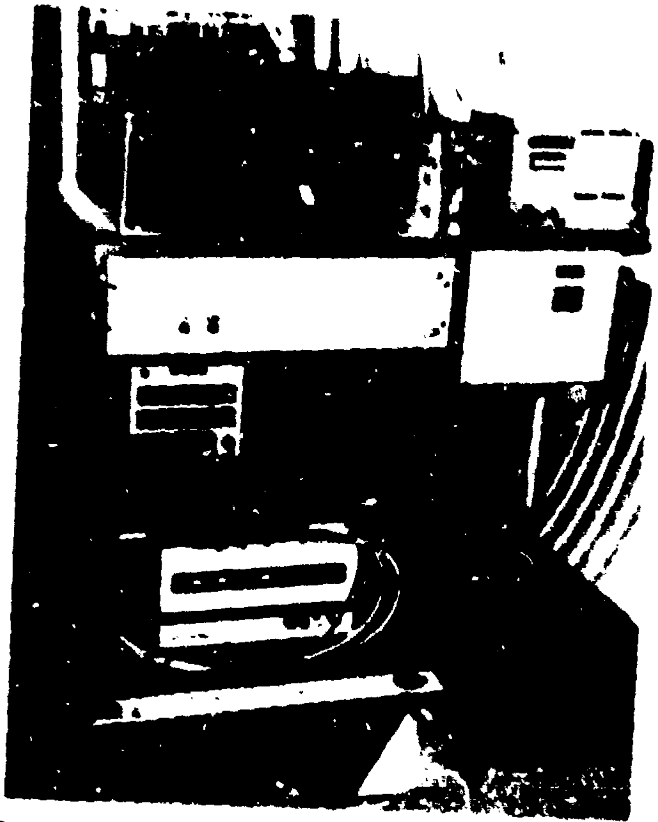

FIGURE 8. AIRCRAFT INSTALLATION OF MINI DIGITAL DATA SYSTEM

FIGURE 9. CAMERA COVERAGE OF PILOT INSTRUMENT PANEL

weather stations typically located at selected microphone locations for continuously recording the same parameters as above, but near microphone level (5 feet), and two sets of hand-held motor-driven precision psychrometers and wind-speed indicators.

The MART surface measuring system consists of a Beckman-Whitney Model No. 101 wind system producing a strip-chart record of wind speed and wind direction on time-calibrated paper and a Weather-Measure Model H341 temperature and relative-humidity measuring system, which also produces a time-calibrated strip-chart record.

2.3.3.2 Upper Air Sounding - Upper air sounding data were in general taken before, during, and after the flyover-noise tests to define the vertical gradients of temperature, humidity, and wind. The parameters measured were ambient air temperature, wind speed and direction and difference between wet- and dry-bulb temperatures. Data were recorded to the height of the test aircraft for a given series of flyovers (up to about 8000 feet). The minimum accuracies of these measurements were $\pm 0.5^{\circ}F$ for air temperature and the difference between dry-bulb and wet-bulb temperature, ± 3 knots for wind speed, and ± 10 degrees for wind direction. The sounding data summarized in Appendix B were obtained by the National Weather Corporation. The Figure B-4 plots represent data that was continuously recorded from ground level to the maximum altitude.

2.3.4 Space-Positioning Parameters

Accurate space-positioning data must be available during noise-data processing to define propagation distances for sound-path normalization. The sound-path distance must be precisely synchronized in time with the noise data. A Mobile Automatic Laser Tracking system (MALT) uses an autotrack monopulse optical-radar, with a multipower laser as the ranging beam energy source. MALT, which is self-contained in a small truck (Figure 5) uses a portable power source and can acquire, track, and record the position of a retroreflector-equipped airplane. ..acking range is up to 60,000 feet, with elevation and azimuth coverage of -5 to +45 degrees, and ± 120 degrees, respectively. If line of sight permits, microphone locations can also be determined from the MALT van, thereby eliminating the need

for normal surveying. All space-positioning data (and time codes) are recorded on magnetic tape in a digital format for subsequent computer processing.

Target acquisition is initially obtained manually by using a television monitor. Subsequent automatic tracking provides azimuth, elevation, and range data for magnetic-tape recording. The target aircraft retroreflector (Figure 5) reflects a 1060-Angstrom laser beam back to the receiver. The transmitter is a flash-pumped, Q-spoiled Nd:YAG laser that develops 1-MW peak power at a rate of 100 pps. The power of the system is automatically controlled as a function of range to keep the radiated power below the eyesafe level. Position accuracies achieved are ±1.0 foot for aircraft at a range of 2000 feet and ±12.0 feet at a range of 30,000 feet from the MALT system.

Data processing is accomplished on either the IBM 360 or Sigma 7 computers by using the original recorded tape as the input data tape. Space position data relative to the runway, or relative to any other desired coordinate system, are provided in selectable tabular or plotted formats. Velocity and acceleration data are derived from position data by standard vector techniques. Orientation and calibration of the MALT system are achieved by tracking surveyed static targets before and after each test. The processed data provide the rotation and translation coefficients necessary to represent the position of the aircraft relative to the desired coordinate system.

SECTION 3
DATA PROCESSING AND ANALYSIS

The information acquired for the various flyover-noise measurement parameters is processed by analog and digital data reduction and analyses. The Douglas-developed Flight Data Center (FDC) contains a large-scale digital computing system (XDS Sigma 7) and a variety of input and output devices, including tape drives, line-printers, card-readers, Cathode-Ray Tube visual displays, and hardcopy displays. The FDC which is shown in Figure 10 is the facility where all of the various types of data acquired by the noise-measurement system described in the previous section are integrated to generate the normalised flyover-noise levels discussed. The magnetic tape generated by the FDC is used as an input to a computer program determination of noise levels adjusted to reference conditions of weather and aircraft performance.

3.1 DATA PROCESSING SUBSYSTEMS

Noise signals on magnetic-tape recordings are reduced to time-series spectra by the Douglas-developed Controlled Integrating Spectrum Analyzer (CISA) shown in Figure 10. Figure 11 is a block diagram of the system, showing the data flow and monitoring points. The system consists primarily of a General Radio (GR) 1921 Real-Time Audio Spectrum Analyzer controlled by a small digital computer. An incremental magnetic tape is generated for further data processing within a large-scale digital computer (XDS Sigma 7). The GR-1921 is a hybrid spectrum analyzer with 24 analog 1/3 octave band filters and a digital detector section employing true integration techniques. This analysis system meets the requirements specified in Paragraph A36.2(d) of FAR Part 36. Table 2 lists some of the basic characteristics of the major components comprising CISA.

Each flyover-noise recording was digitized by using a 0.5-second integration period mode within the GR 1921, to encompass ambient noise and the 10-PNdB down points both prior to and past the point of maximum Tone Corrected Perceived Noise Level (PNLTM). The digitizing time-spans were determined from A-weighted-level histories of the flyover-noise recordings.

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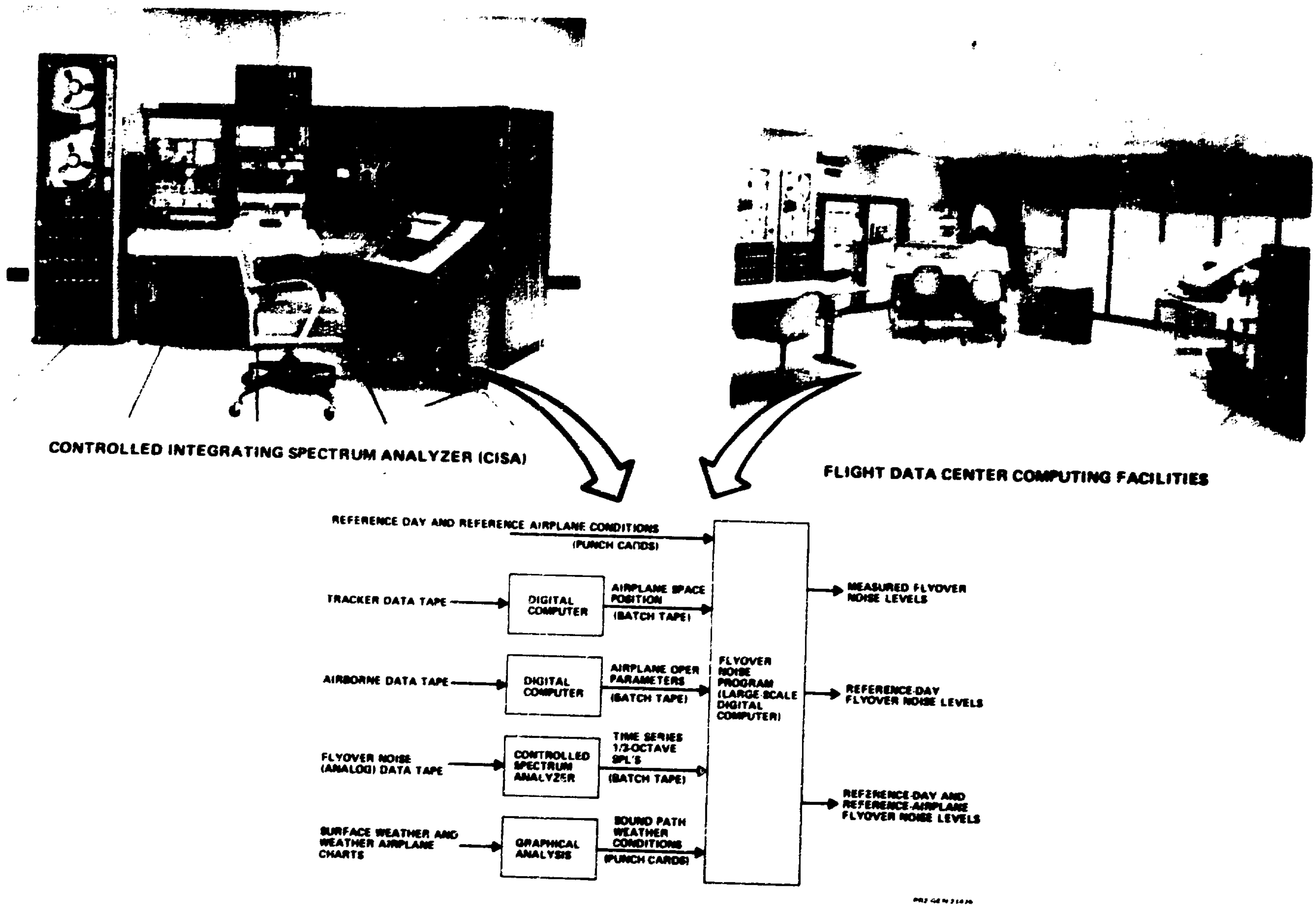


FIGURE 10. FLIGHT DATA CENTER

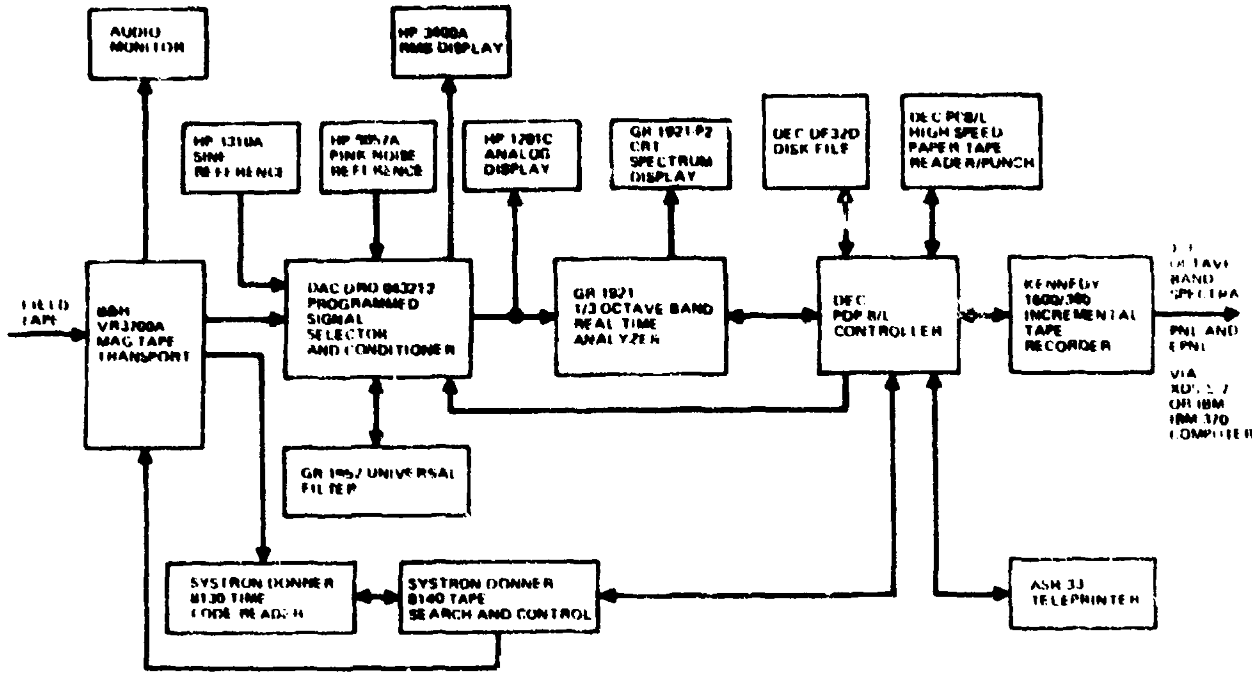


FIGURE 11. CONTROLLED INTEGRATING SPECTRUM ANALYZER (CISA)

TABLE 2

CHARACTERISTICS OF THE CONTROLLED INTEGRATING SPECTRUM ANALYZER (CISA)

I	GENERAL RADIO 1921 REAL TIME AUDIO SPECTRUM ANALYZER		
	FILTERS	ONE THIRD OCTAVE BAND (ANALOG)	
	CHANNELS	30 PARALLEL	
	FREQUENCY RANGE (GMF)	12.5 HZ TO 10 KHZ	
	DYNAMIC RANGE	60 dB (DISPLAYED)	
	TYPE OF DETECTOR	DIGITAL (TRUE INTEGRATION)	
	BASIC ACCURACY	±0.5 dB (±1.0 dB OVER ENTIRE AMPLITUDE RANGE)	
	RESOLUTION	±0.25 dB	
	CREST FACTOR CAPACITY	10 dB AT FULL SCALE	
	DETECTOR CHARACTERISTICS	RMS WITH TRUE (LINEAR) INTEGRATION	
	INTEGRATION PERIODS	NOMINAL (SEC)	ACTUAL (SEC)
		1/8	[illegible]
		1/4	[illegible]
		1/2	0.500
		1	1.150
		2	2.300
		4	4.600
		8	9.199
		16	18.398
		32	36.794
	DIGITAL OUTPUTS	BCD AND BINARY	
	NOMINAL SENSITIVITY	0.1 VOLTS RMS FULL SCALE	
II	DIGITAL EQUIPMENT CORP. PROGRAMMED DATA PROCESSOR (PDP 8/L)		
	MEMORY SIZE	4096 12 BIT WORDS	
	CYCLE TIME	1.6 MICRO SECONDS	
	I/O FACILITIES	ASR 33 TELETYPE HIGH SPEED PAPER TAPE READER/PUNCH	
	PROGRAM LANGUAGE	PAL III	
III	KENNEDY MODEL 1600/360 INCREMENTAL TAPE RECORDER		
	TAPE DENSITY	800 BPI	
	WRITING SPEED	500 CHAR/SEC	
	TAPE	1/2 INCH COMPUTER TAPE	
	TAPE FORMAT	IBM SYSTEM 360 COMPATIBLE 9 TRACK NRZ	
	CONTINUOUS READ CAPABILITY		
IV	SYSTRON DONNER 8130 TIME CODE TRANSLATOR		
	CODE	MODIFIED IRIG B	
	CODE OUTPUT	BCD OF HOUR, MINUTE AND SECOND	
V	BELL & HOWELL VR 3700A CEC DATATAPE		
	TRACKS	14	
	SPEED	3 3/4 IPS TO 120 IPS	
	TAPE	1 INCH WIDTH	
	MODE	FM	
	BANDWIDTH (±3 dB)	DC-10,000 HZ AT 30 IPS IN FM MODE	
VI	PROGRAMMED SIGNAL SELECTOR AND CONDITIONER		
	ATTENUATION	1/2 dB STEPS	
	ACCURACY	±0.1 dB/STEP	
VII	SYSTEM OUTPUT AND TIMING		
	MAGNETIC TAPE OUTPUT FORMAT	BINARY AND ASCII	
	CONTENTS	BAND NO., LEVEL (dB) PLUS IDENTIFICATION	
	24 CHANNEL GR1921 PDP 8 DATA TRANSFER	1.3 MSEC (TOTAL TIME PER INTEGRATION PERIOD THAT NOISE DATA IS NOT BEING ANALYZED)	

The sound pressure level reference calibration signals, the broadband "pink" random noise, the frequency-response calibration signals, and the ambient noise were digitized for subsequent computer processing. Approximately 10 seconds of ambient noise were analyzed for each flyover-noise recording. To obtain a maximum degree of repeatability, the "pink" noise frequency-response calibration was processed by ensemble averaging within the XDS Sigma 7 of thirty 2.3-second integration-time data samples.

The Douglas-developed FORTRAN computer program (L3SL operating on an XDS Sigma 7 computer) is used to automatically edit and combine the measured 1/3-octave-band levels from the CISA system, the space-positioning data generated by MALT, the airplane-performance data as recorded by the ADDS, and the meteorological data from MART to obtain normalized 1/3-octave and full-octave band SPL's, as well as other flyover-noise measures such as PNL, PNLT, and EPNL (Figure 12). With the exception of the meteorological data, all of the above data are recorded in digital format on magnetic tape, with punched cards as an alternate. The meteorological data are normally input on cards.

To meet the requirements of FAR Part 36, Paragraph A36.2(d) (4), the computer program performs "moving averages" of three 0.5-second scans (obtained from the CISA 0.5-second integration-time samples) to produce sound pressure level values (corresponding to "Slow" on a Sound Level Meter) every 0.5 second.

The computer program corrects any effects that the ambient noise may have on the flyover-noise sound pressure levels and to ensure that erroneous spectral irregularity corrections are not computed when the flyover-noise levels fall below the ambient noise levels. All flyover-noise levels between 5 dB and 10 dB of the ambient noise are corrected for the presence of the ambient noise on an energy basis. The standard acoustical procedure used consists of converting the decibel levels to relative powers, subtracting the ambient power from the flyover-noise power, and then converting back to decibels. All flyover-noise band levels within 5 dB of the ambient-noise

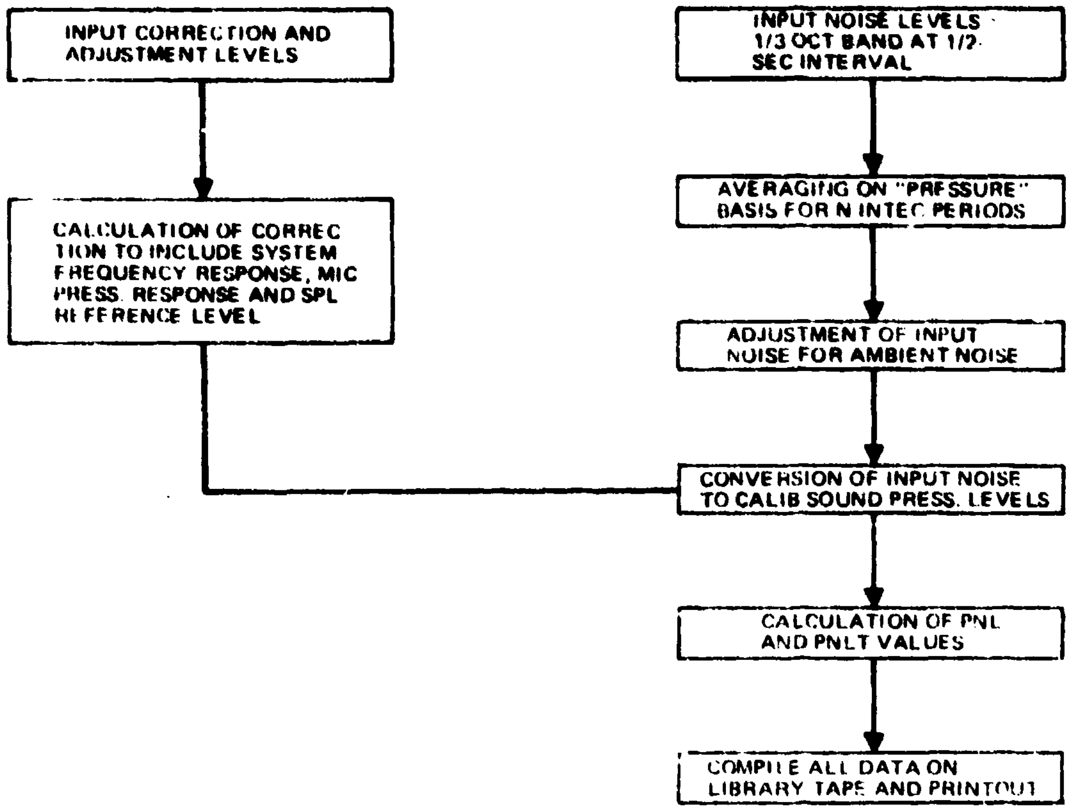


FIGURE 12. BASIC DATA COMPUTING FLOW FOR TEST DAY PNL'S AND PNLT'S (PROGRAM L3SL)

band level are deleted. For the spectra with deleted noise band levels, additions were made to the tone-correction procedure of Appendix B, FAR Part 36. Thus averaged levels (from pre- and post-deleted band levels) are used to prevent calculation of erroneous tone corrections for spectra with deleted-noise band levels.

The computer program automatically accounts for all gain adjustments applied to the data generated by CISA, normalizes the 1/3-octave band levels using reference-level calibration signals of any frequency in the range of interest, adjusts for system frequency response by using recorded broadband-random pink-noise signals, and accounts for the presence of background noise on an energy basis.

Values of PNL and EPNL were derived after the application of FAR Part 36 required procedures. They include data-averaging time, averaging-time mode, duration-time mode, deletion of spurious tone corrections, atmospheric-attenuation corrections (Reference 2), and reference flight profiles and/or reference microphone positions.

The L3SL OCUM* output tape was combined with airplane measured and calculated engine performance data (program C3AC) by using Sigma 7 Computer Program A9NG. The resulting Sigma 7 TMERGE* tape was then input into IBM 370 computing system utility program A9NA.

For engine parameters such as rotor speed (N_1), a short time average (time = closest point of aircraft/200) centered about PNLTM (± 0.5 sec) was obtained. A simple average of the N_1 from each of the engines was computed and used as the N_1 for that flyover. Other parameters on the data tabulations that remain constant during each run, such as flap position, were obtained directly from the tabulations.

For certain incomplete MALT space-positioning data, a manual position technique was used to determine aircraft position and path airspeed data. The technique is discussed in Appendix A.

The output of the data-processing procedure consists of a variety of line printer tabulations, computer-generated plots, and a computer-generated c   sed composite magnetic tape that contains the time histories of the tes day 1/3-octave band sound pressure levels, time correlated with engine and flight parameters weather, and space position data. This tape is generally the source of data for subsequent engineering analyses.

3.2 AIRCRAFT THRUST CALCULATION

Thrust was obtained from an engine performance program (F2RA02) made up of installed-engine fan and gas-generator characteristics coupled with a thrust calculation procedure based on the Douglas nozzle characteristics. These characteristics were derived from flight tests of the JT3D-3B-powered DC-8-55 and DC-8-61 aircraft during initial certification.

Thrusts for the Phase II test runs were obtained by using the measured in-flight engine pressure ratios (EPR) for the given test-run flight conditions with the F2RA02 engine performance program.

*Douglas designation for binary magnetic tape record

3.3 DATA ANALYSIS, ADJUSTMENT, AND PRESENTATION

3.3.1 Data Analysis

The magnetic tape generated by the digital computing system (XDS Sigma 7) is the source of input data for an IBM 360 computer program (E2QH) used to process the flyover-noise data to determine test and reference-day EPNL's and peak A-weighted sound levels. A flow diagram of this program is given in Figure 13. The line printer output from the E2QH computer program provides test and reference-day (77°F and 70 percent relative humidity), time histories at 0.5 second intervals, aircraft slant range, 1/3-octave band sound pressure levels, perceived noise levels (PNL), tone corrected perceived noise levels (PNLT), A-weighted sound levels, and overall sound pressure levels. The ambient 1/3-octave band and overall sound pressure levels for each measurement are listed. Test and reference-day effective perceived noise levels (EPNL) are also calculated. Representative examples of this presentation are shown in Table C-2 of Appendix C. For final presentation, the EPNL data are adjusted in accordance with FAR Part 36 procedures to reference conditions appropriate for the aircraft, and noted for each set of curves.

Presented in Table E-1 of Appendix E is a summary of the test-and reference-day EPNL and peak A-weighted sound levels, the applicable adjustments to these levels, and the corresponding adjusted values for the flyover-noise levels. Discussed in Appendix E, is the sequential procedure followed in applying each adjustment to derive the flyover-noise levels.

3.3.2 Data Adjustments

The E2QH computer program is based on the specified procedures of FAR Part 36 and is designed to provide flyover-noise levels for aircraft noise certification. To meet the data presentation requirements for the Aircraft Noise Definition Program certain adjustments must be made to the EPNL and A-weighted sound levels provided by the production version of the E2QH computer program. These adjustments were made to account for the presence of psuedotones and to normalize each run to a target aircraft power setting and airspeed. The discussion of psuedotones is presented in Appendix D. For the Phase II data, Table E-1, all tone corrections at

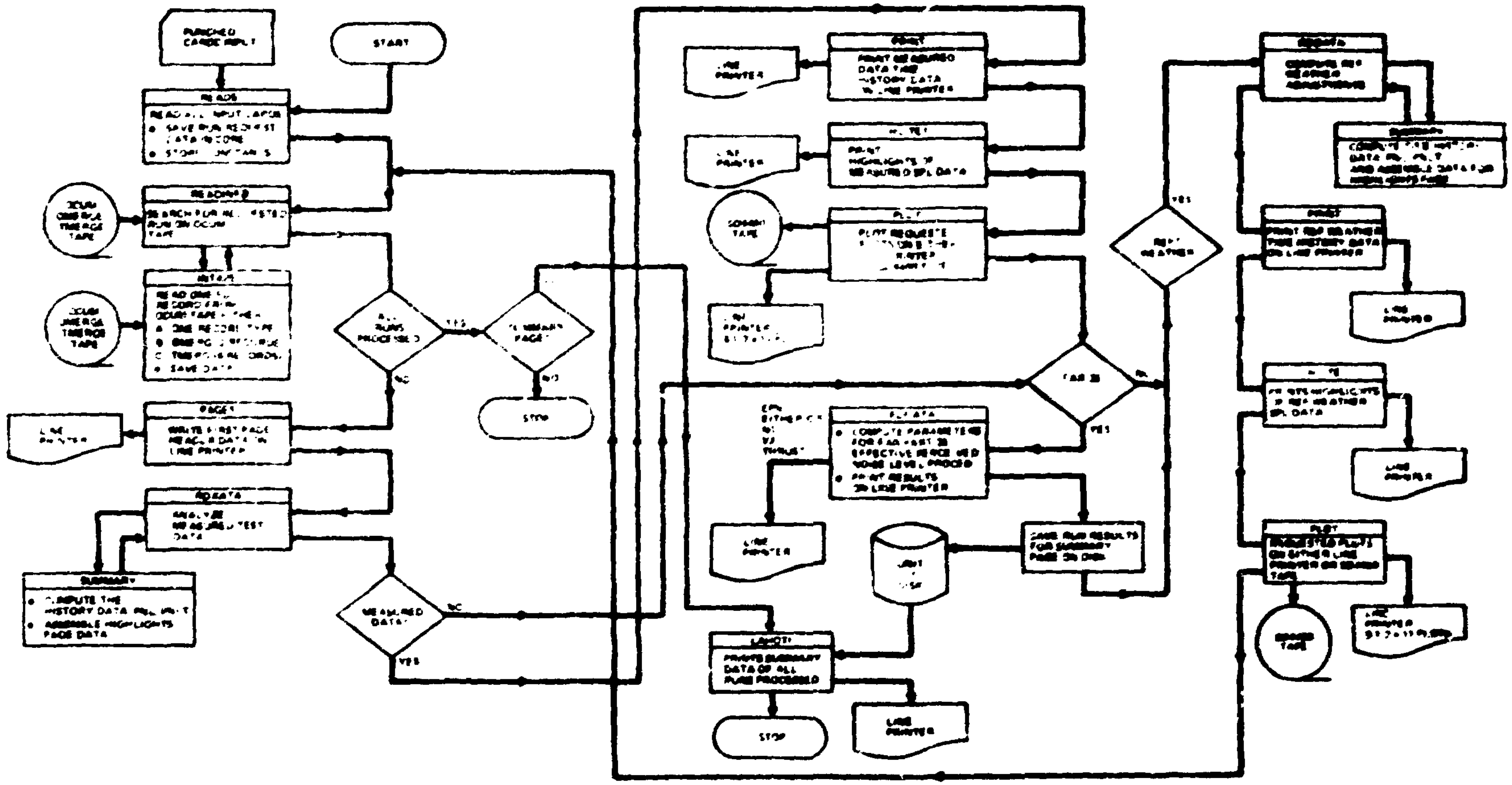


FIGURE 13. FLOW DIAGRAM OF IBM 360 NOISE COMPUTER PROGRAM E20F/E20H

frequencies below 1600 Hz were considered as pseudotones resulting from ground reflection phenomena and not characteristic of the source noise. Therefore, the PNLT values obtained from the (E2QH) computer program analyses were modified, as necessary, so as not to be based on pseudotone corrections. A summary of the pseudotone adjustments is shown in Table D-1 of Appendix D.

Power-setting adjustments are made in both EPNL's and A-weighted levels to normalize each data point to the target thrust of the group. The adjustments applied to the reference-day noise levels are listed in Columns 18 and 20 of Table E-1.

The reference-day EPNL's are adjusted to reference airspeeds appropriate for the power setting. Column 17 of Table E-1 is a tabulation of the corrections determined by the relation

$$\Delta EPNL = 10 \log_{10} (V_{Test}/V_{Ref}).$$

The reference airspeeds (V_{Ref}) are representative of those associated with FAR Part 36 noise certification at the DC-8-61 maximum takeoff and landing gross weights (325,000 and 240,000 pounds) and their respective flap settings 15 and 50 degrees. On the basis of reference-day weather conditions, the reference airspeeds used were 180 KTAS for takeoff and 155 KTAS for approach.

3.3.3 Data Presentation

The reference-day, adjusted noise levels, listed in columns 19 and 21 of Table E-1 provide the input data for the noise curve development procedure discussed in Appendix F. The adjusted acoustic data are plotted as noise level variation with distance in groups comprising data of one power setting, and a least-square curve is faired through the data points. For purposes of smoothing and extrapolating the curves, cross plots are made at selected slant ranges to provide the means for plotting all the desired thrust settings.

Power settings for the DC-8 aircraft are identified by referred net thrust (F_N/δ_{amb}); approach power settings are also identified by referred fan speed ($N_1/\sqrt{\theta_{T_2}}$), in order to be compatible with the approach performance

charts in Reference 1. Linear interpolation may be used for determining noise levels at intermediate power settings within a set of curves normalised to the same airspeed.

For thrust values between takeoff and approach, appropriate adjustment of the noise curve is required before the interpolation is performed. The difference in terms of EPNL between takeoff and approach airspeeds is 0.6 EPNdB. The transition range for the DC-8 aircraft is between 6000 and 8000 pounds. If, for example, the DC-8-61 is in a takeoff condition at 7500 pounds thrust, the levels along the 5000-pound thrust curve should be decreased by 0.6 EPNdB (corresponding to conversion to 180 KTAS) before interpolation is performed. If the airplane is in approach, the 0.6 EPNdB should be added to the 8000-pound curve before interpolation is performed.

The power setting usually falls within the airspeed range of either takeoff or approach, and the airspeed correction applied to the curve value of EPNL is calculated in a straightforward manner.

SECTION 4
DISCUSSION OF RESULTS

The analysis and resultant noise level information presented in this report are based on the flyover-noise measurement data obtained from the Phase II DC-8-61 aircraft flight test conducted during the period 6-8 November 1973. The analytical methodology and acoustic data computations developed in Phase I of the program were applied to the data. The results of the analysis of the acoustic data are presented as variations with slant range of reference-day (77°F, 70-percent humidity) EPNL and peak A-weighted sound level's, dBA, (maximum A-weighted sound levels during flyover). The data were plotted for several power settings ranging from takeoff thrust to the thrust typical of a high-glide-slope approach. In addition, the effects of elevation angle or sideline distance from the flight path were studied, and levels of lateral noise attenuation were defined. The statistical accuracy of the data used in the EPNL plots was also determined.

4.1 EFFECTIVE PERCEIVED NOISE AND A-WEIGHTED SOUND LEVELS

The results of the analysis of the Phase II flyover-noise measurements are presented in Figures 14 and 15 as EPNL and A-Weighted sound level variations with slant ranges. The preparation of the plots followed the techniques discussed in Section 3 and was identical to that used in the Phase I analysis of existing DC-8-61 flyover-noise data.

Comparison of Figures 14 and 15 with the respective plots of Phase I data (Figures 3 and 4 of Reference 1) shows a general overall lowering of noise levels for a comparable engine thrust and slant range. Plots of the EPNL variations with slant range are compared in Figure 16 for two representative thrust settings. The difference in EPNL's varies between 4 dB at short slant ranges (400 feet) and 6 to 12 dB at large slant ranges (5000 feet). A similar comparison between the A-weighted sound levels would show 2 to 4 dB(A) at short ranges (400 feet) and 5 to 9 dB(A) at large slant ranges (5000 feet).

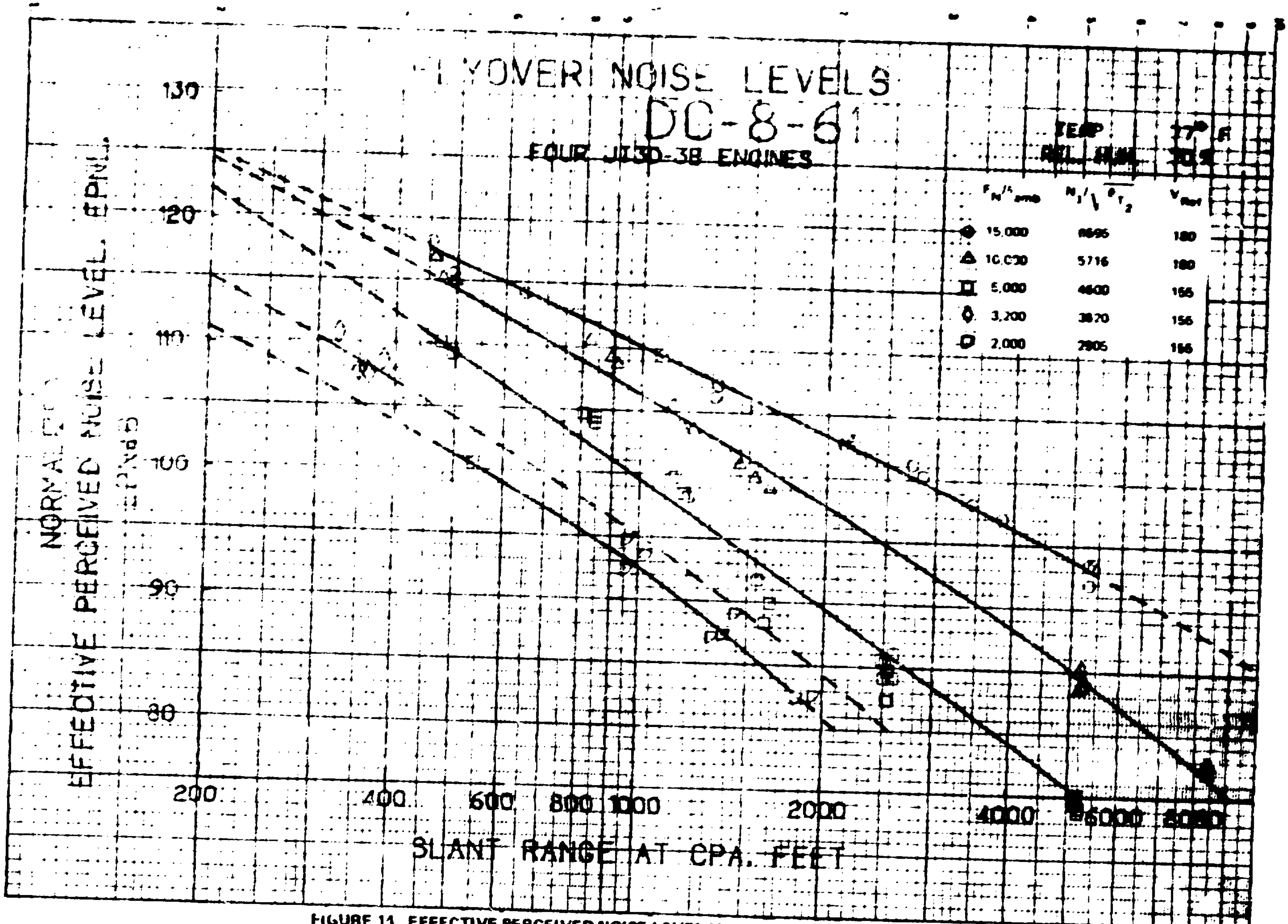


FIGURE 11. EFFECTIVE PERCEIVED NOISE LEVEL VARIATIONS WITH SLANT RANGE

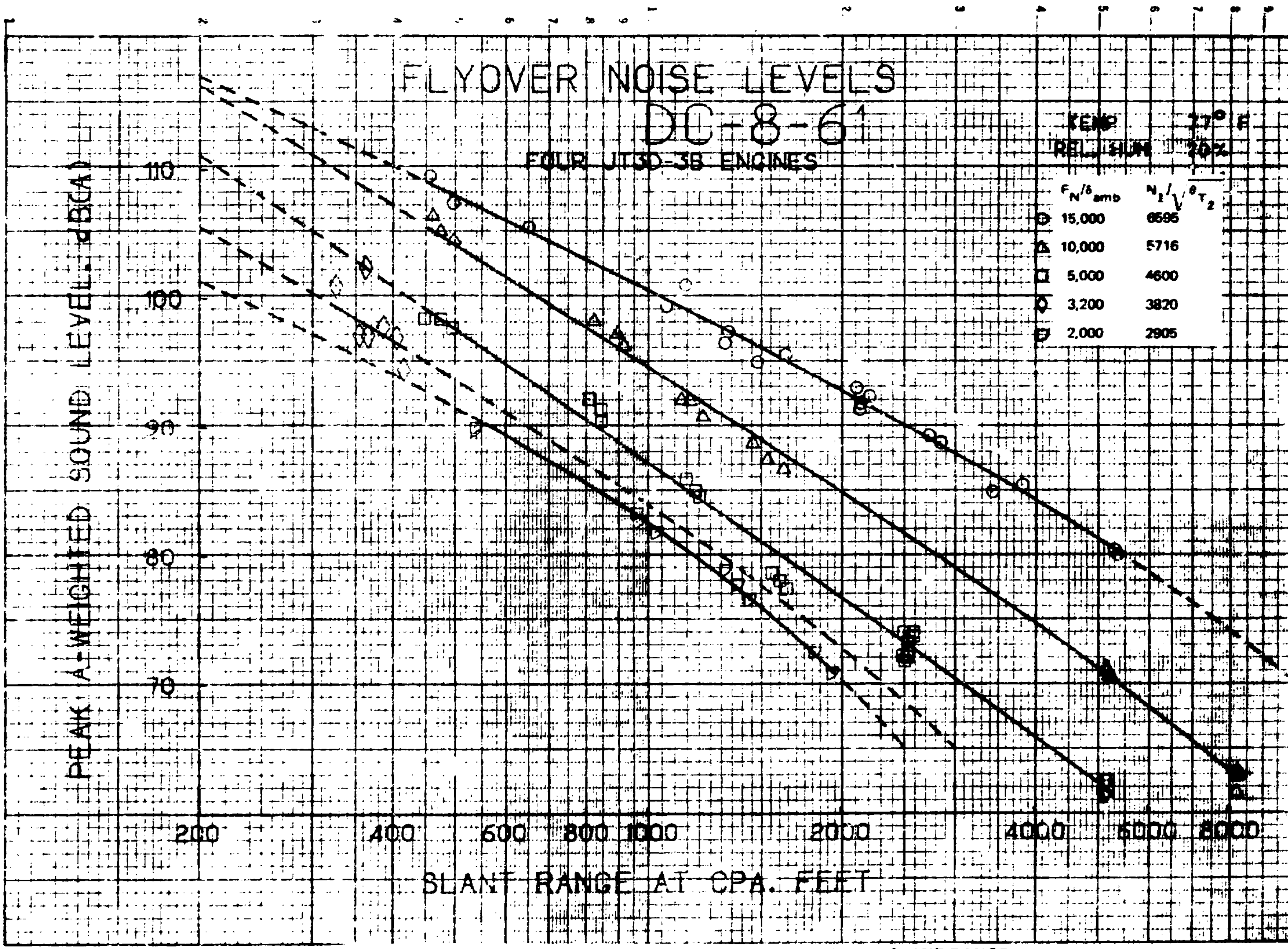


FIGURE 15. PEAK A-WEIGHTED SOUND LEVEL VARIATIONS WITH SLANT RANGE

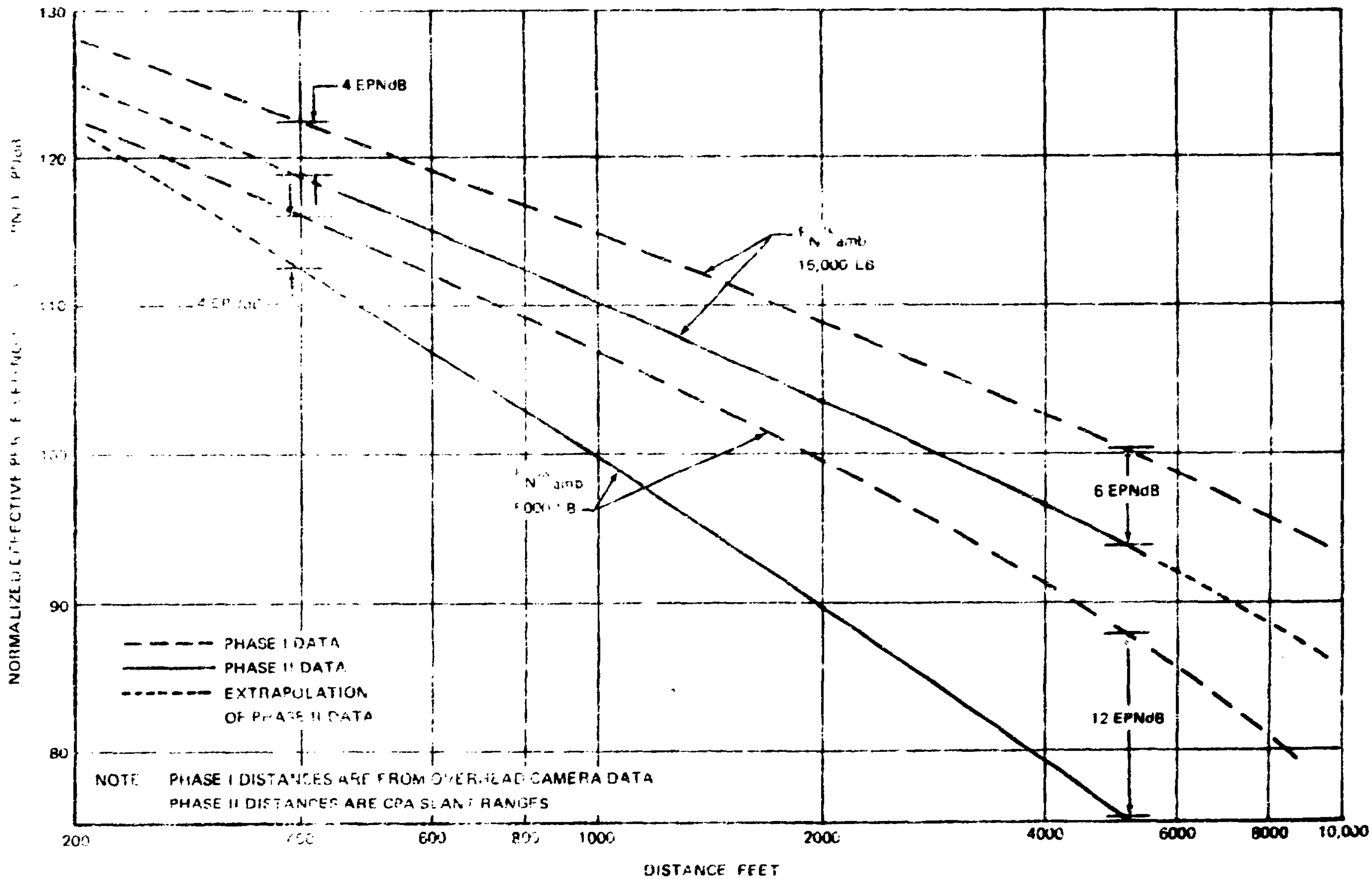


FIGURE 16. COMPARISON OF PHASE I WITH PHASE II NOISE LEVELS

An investigation of these differences was made by reviewing the methods used in data acquisition, processing, and analysis. The investigation identified several factors that could explain the differences in the two sets of data. Quantitative estimates of the effects of three of the factors have been made, but such estimates of the effects of other factors are not available. The discussion that follows indicates the effects of the partial adjustment resulting from the application of the three quantitative estimates.

Different methods were used in determining the flight paths of the airplane. For the Yuma tests, the MALT tracking system (Paragraph 2.3.4) was used, which has a demonstrated accuracy of ±0.05-percent. For the Fresno tests, the less accurate photographic method was used. The photographic method has a ±10-percent estimated degree of repeatibility (within two standard deviations).

The noise measurement and data processing systems for the two tests were not identical, but it is believed that the differences could not have introduced any appreciable variances in the noise data.

There were three differences in the noise analyses. First, the Yuma data were corrected for pseudotones in the low frequency bands of the spectra. No pseudotone corrections were applied to the Fresno data, however. Had corrections been applied, the Fresno data would have been adjusted downward by about 1 EPNdB. Second, the sound-path distances were determined differently. The direct overhead height to the aircraft was taken as the sound-path distance in the Fresno tests. For the Yuma tests, the true sound-path distance (distance between microphone and airplane at the time of PNLTM) was used. A quantitative estimate of the effects of this difference is not available. Third, the aircraft overhead height was taken as the slant range at CPA in plotting the Fresno data. The Yuma data were plotted at the true values of slant range at CPA. The use of the true slant range for the Fresno data would have reduced the noise levels approximately 0 to 0.5 EPNdB. The simplifying assumptions used in the Fresno analyses were appropriate in that program, since the primary objective of the program was the determination of the incremental changes in noise due to nacelle acoustical treatment. Accuracy in the absolute levels of the noise was of lesser importance.

A review of the surface and sound-path weather records obtained during the two tests showed that the surface weather conditions were acoustically similar but that the sound-path weather during the Yuma tests was characterized by generally lower absolute humidities. Differences in the test-day noise spectra tend to reflect the weather variations in that the low-frequency bands of the spectra tended to agree well, but the SPL's in the higher frequency bands for the Yuma data tended to be lower. In conformance with Part 36 procedures, weather corrections have been based only on surface weather.

Although no validated method for adjusting noise for sound-path weather variations is known, an estimate was made of adjustments in the Yuma data that might roughly account for the sound-path weather variations. This estimate and its results are presented in Appendix G, where possible adjustments ranging from +0.3 to +2.9 EPNdB are indicated. The adjustments for the takeoff power average +0.7 EPNdB, for cutback power +1.2 EPNdB, and for approach power +1.8 EPNdB. Corresponding adjustments for the Fresno data are not available.

The three quantitative adjustments mentioned above are compared in Table 3 with the incremental differences. An explanation of the residual differences shown in Table 3 could conceivably be found in the combined effects of the lesser altitude accuracy of the Fresno data and the lack of a consistent and validated method for adjusting both sets of data for sound-path weather variations.

TABLE 3
PARTIAL ACCOUNTING OF DIFFERENCES BETWEEN
PHASE I AND PHASE II

	LOW ALTITUDE/ APPROACH THRUST (400 FT/5,000 LB)	LONG SLANT RANGE/ TAKEOFF THRUST (3000 FT/15,000 LB)
REPORTED EPNL DIFFERENCE (PHASE I – PHASE II, FIGURE 16)	+4	+6
PSEUDOTONE ADJUSTMENT	1	1
ALTITUDE VS CPA PLOTTING ADJUSTMENT	0	-0.5
LAYERED WEATHER ADJUSTMENT	2	-1
ADJUSTED DIFFERENCE (PHASE I – PHASE II)	+1	+3.5

4.2 LATERAL NOISE ATTENUATION

The determination of noise levels from an aircraft flyover directly overhead depends on measurement of a complex set of physical variables. The variations of noise level with distance shown in Figures 14 and 15 are based on measurement of these variables. However, the generation of community noise-impact area contours utilizes not only overhead noise data but also data from the slant-range sideline noise measurements for given aircraft-altitude profiles. Variations of extra ground attenuation (EGA), shielding, and directivity effects as functions of elevation angle (β), must be considered in any accurate definition of noise impact area. As a Phase II study objective, data were measured on either side of the flight path during aircraft flyovers and analyzed in an effort to determine these combined effects on lateral noise attenuation.

Figure 17 is a plot showing the variation of lateral noise attenuation with elevation angle (β) for three power settings. The variation is a function of β and the distance D to the side of the flight path. The data points shown comprise a range of sideline distances from 2500 feet to 8000 feet and slant ranges to approximately 9900 feet.

To normalize the data, differences in noise levels for equal overhead and sideline sound paths were calculated, thus removing effects of attenuation due to atmospheric absorption and spherical divergence. When plotted, the data points collapse to a single curve, rather than the expected spread at any given elevation angle with variations in sideline distance. These data would indicate that the lateral noise attenuation is primarily a function of elevation angle (β); and that the effect of sound path length is negligible. Additional noise-level measurements at sideline distances of 500 to 1500 feet and at low aircraft altitudes (300 feet); as well as large slant-range flyovers at small elevation angles, should help to confirm or revise the observed trend.

4.3 LATERAL PROPAGATION EFFECTS

The possible effects of test-site asymmetry on flyover-noise level measurements are recognized. Other studies (Reference 5) have ascribed

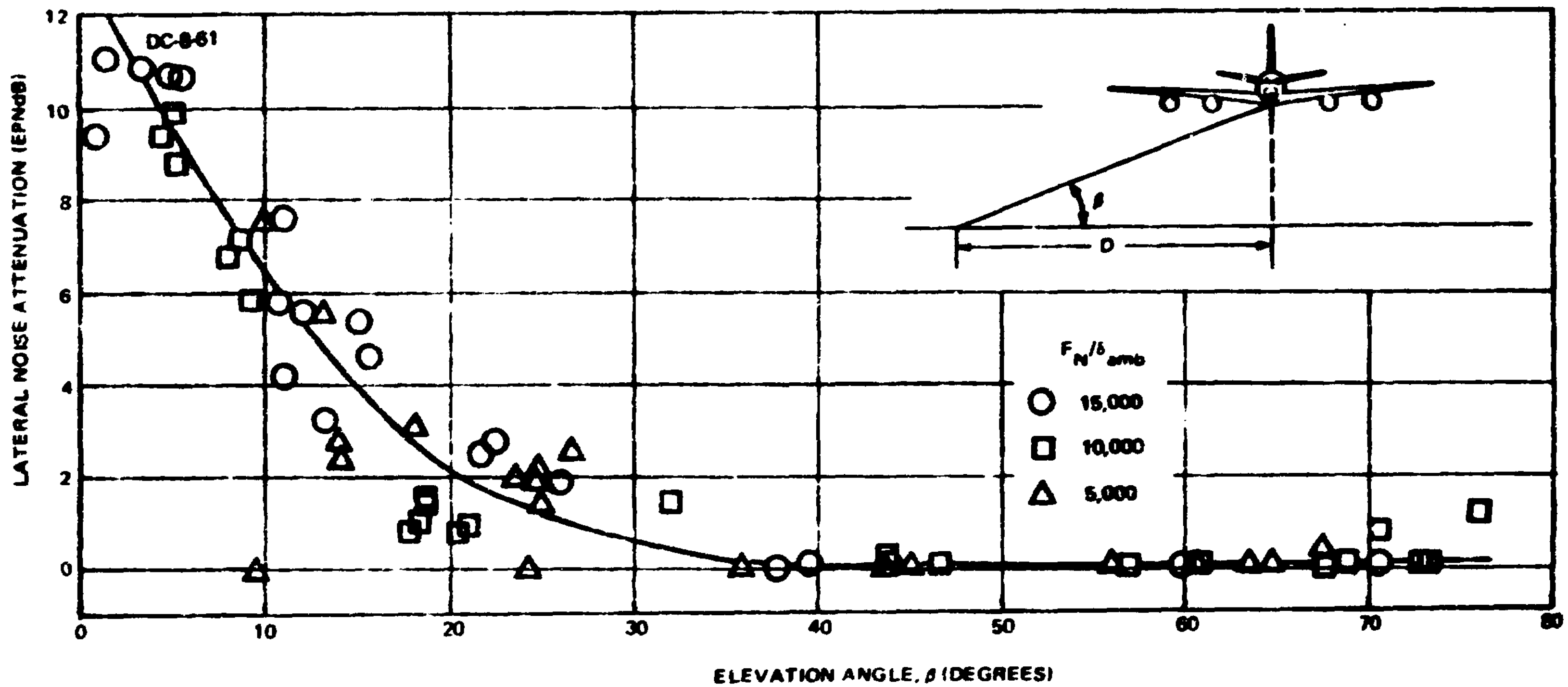


FIGURE 17. VARIATION OF LATERAL NOISE ATTENUATION WITH ELEVATION ANGLE, β

to EGA, anomolous sideline noise levels for small elevation angles (3- to 4-degrees) of the flyover aircraft (400 feet). It was pointed out that elevation differences between sideline measurement locations could be the "explanation" for differences in long-range (6000 feet), symmetrical, sideline noise-level measurements.

In selecting Yuma International Airport as the test site for the Phase II flyover tests, consideration was given to the relatively flat terrain; and although the data from the tests have limitations (single location on NW side), a quantitative evaluation was made of the test site asymmetry.

Figure 18 shows plots of EPNL variations with distance to the sideline of the flight path, at altitudes near 1, 000 feet, for thrust settings of 15, 000, 10, 000, 5, 000, and 2, 000 pounds. The plots show symmetry for the data available, however, on one side only a single location at 2500 feet was used. Therefore, the symmetry at large sideline distances and low elevation angles could not be determined.

Figure 19 presents similar plots for thrusts of 15, 000, 10, 000, and 5, 000 pounds at altitudes near 5000 feet. The curves are relatively flat compared to those in Figure 18, this demonstrates the effect of the difference in sound path length between overhead and sideline locations. The relative increase in sound path lengths in going from an overhead distance of 1, 000 feet to a sideline distance of 8, 000 feet is approximately eight times (Figure 18); the relative increase in sound path distance in going from an overhead distance of 5, 000 feet to a sideline distance of 8, 000 feet is approximately 1.9 times (Figure 19). The difference in attenuation for these distance factors, based on spherical divergence is approximately 12 dB.

Figure 20 shows the noise level variation for overhead and sideline distances for various aircraft flyover altitudes at takeoff thrust. As the flyover altitude is increased, there is a noticeable flattening of the curves, because the centerline noise levels decrease and the sideline noise levels increase with increasing elevation angle (β).

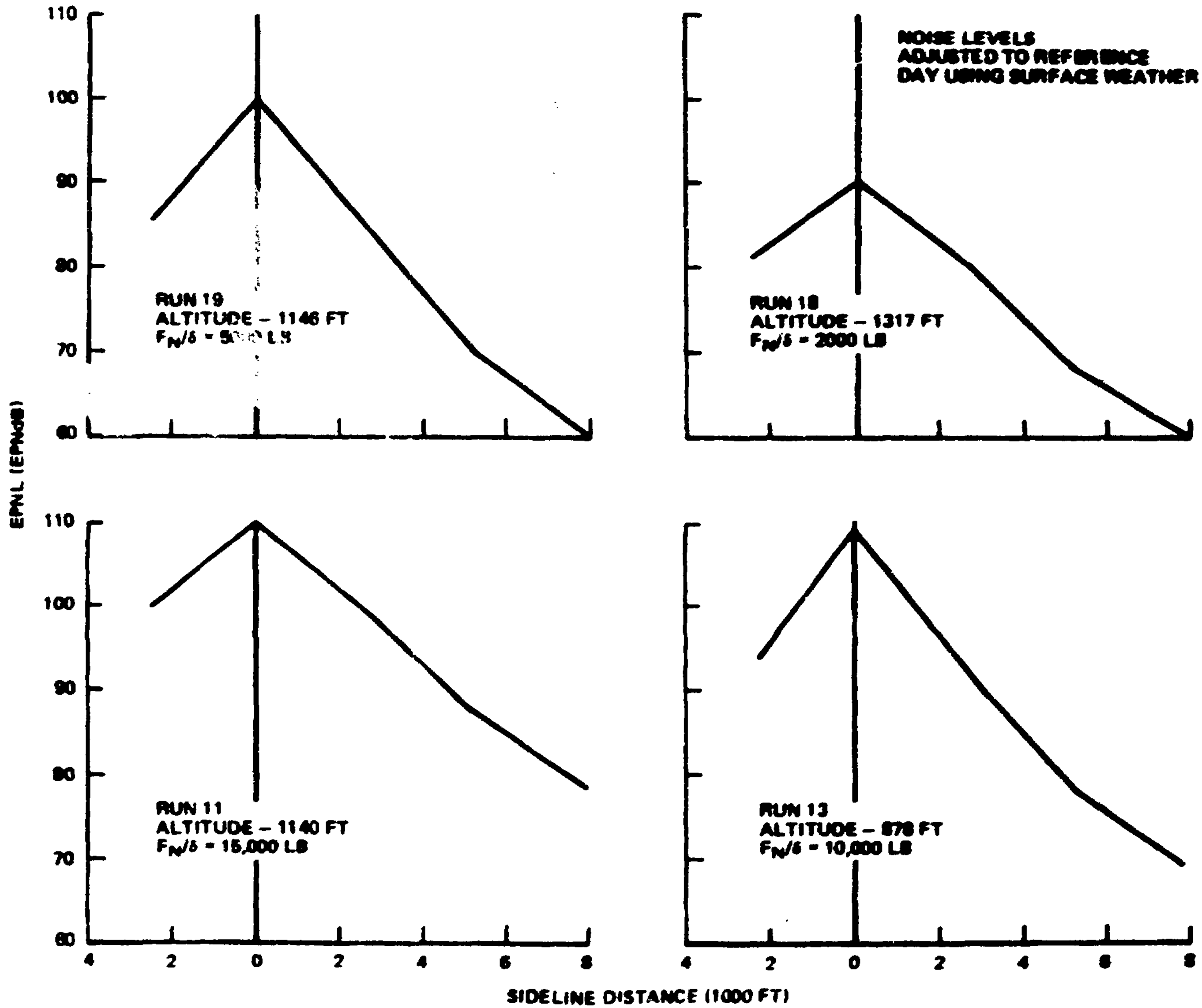


FIGURE 18. VARIATION OF NOISE LEVEL WITH SIDELINE DISTANCE FOR VARIOUS THRUSTS – AIRCRAFT ALTITUDE NEAR 1000 FT

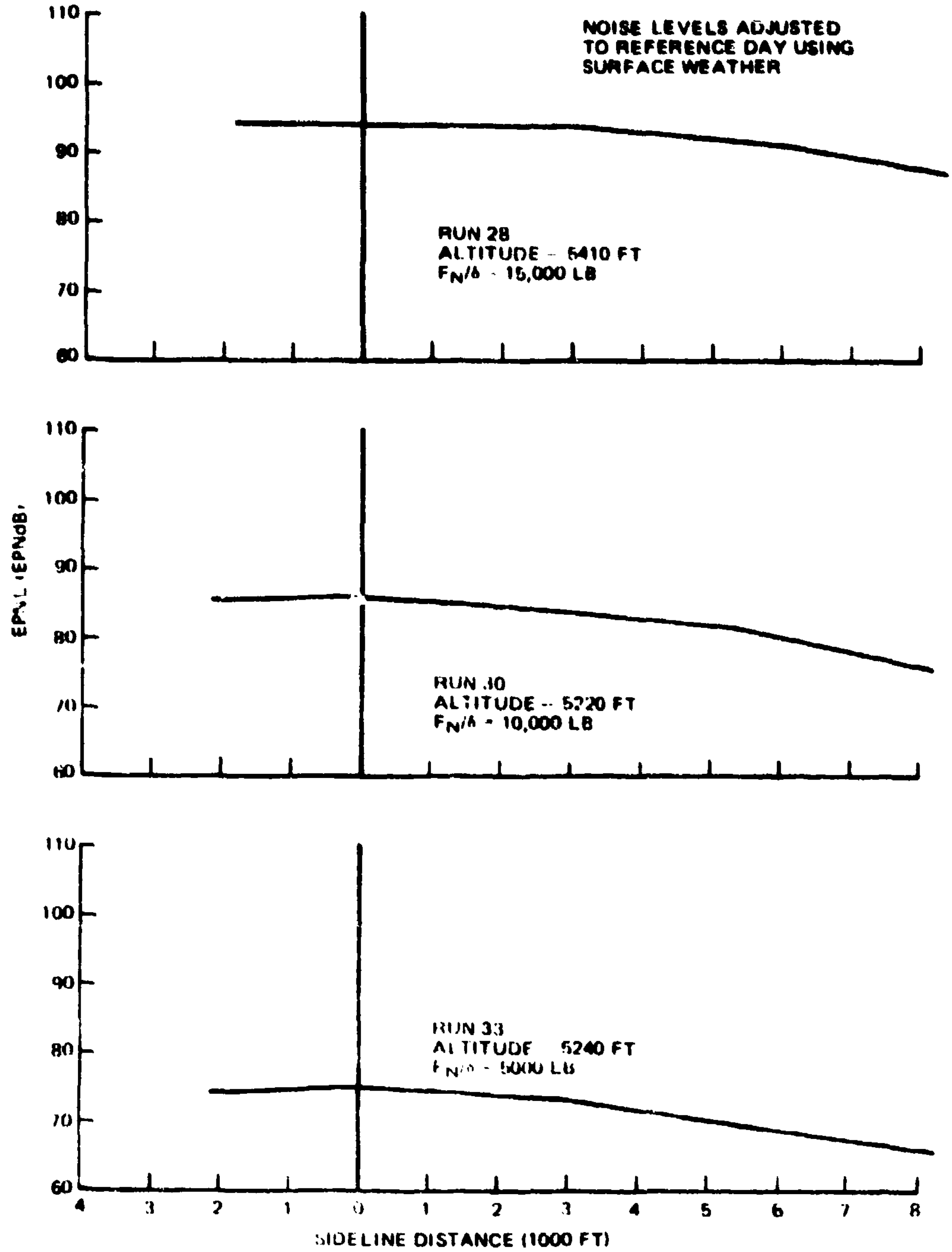


FIGURE 19. VARIATION OF NOISE LEVEL WITH SIDELINE DISTANCE FOR VARIOUS THRUSTS – AIRCRAFT ALTITUDE NEAR 5000 FT

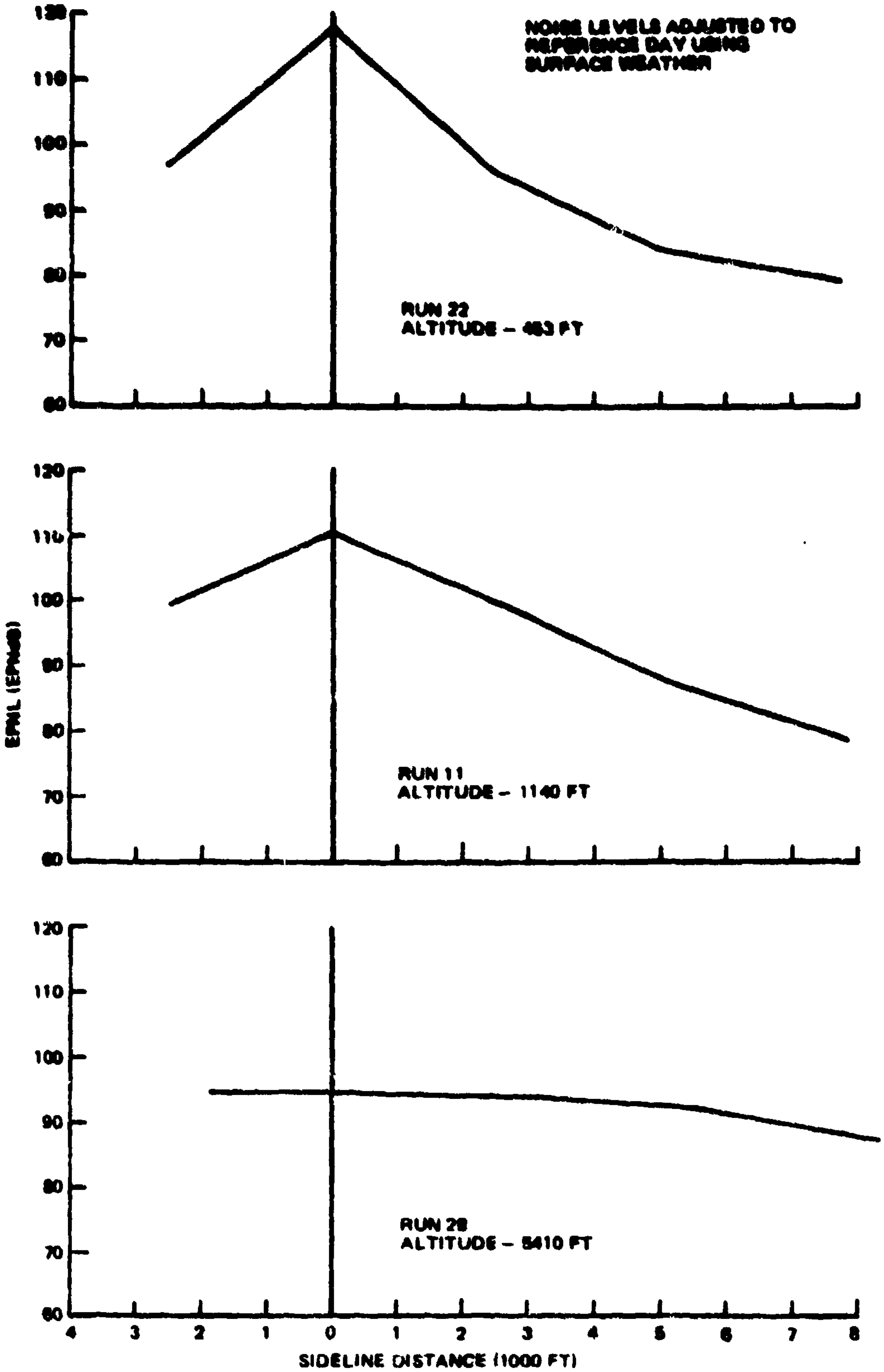


FIGURE 20. VARIATION OF NOISE LEVEL WITH SIDELINE DISTANCE FOR VARIOUS ALTITUDES AT TAKEOFF THRUST, F_N/δ = 15,000 LB

4.4 DATA ACCURACY

The statistical accuracy of the data used in determining the EPNL curves in Figure 14 is tabulated in Table 3 in terms of the 90-percent confidence limits. The noise data used were measured at the centerline microphones, corrected to reference-day conditions and adjusted to the reference airspeed and appropriate target thrust.

The method used in the analysis utilized grouping of the normalized data points by sets in a limited altitude range and adjusting each data point to a common altitude by the technique shown in Figure 21. The sample data point was adjusted from its measured CPA of 1140 feet to the common slant range of 1500 feet along a path parallel to a segment of the 10, 000 pound curve from Figure 14. Applying a ΔEPNL of -3. 3 EPNdB to the measured 105. 5 EPNdB (at the CPA) results in an EPNL of 102. 2 DPNdB. Each point is adjusted to 1500 feet in the same manner, and the percent confidence limits of the six data points determined by using the small sample t distribution method as follows (Page 244 of Reference 4):

The small sample confidence limits, μ, for 90 percent is given by

$$\mu = \bar{X} \pm t_{.05} \frac{S}{\sqrt{n}}$$

where $t_{.05}$ is the distribution factor dependent on the number of samples,

$$S = \sqrt{\frac{(X_1 - X)^2 + (X_2 - X)^2 - - - - + (X_n - X)^2}{n-1}},$$

and $\bar{X}$ = average of n samples consisting of X_1, $X_2 - - - - X_n$.

The results shown in Table 3 indicate the 90-percent confidence limits to be better than $\pm$1. 0 EPNdB, except for the low-altitude range (450-650 feet) at 15, 000-pounds thrust ($\pm$1. 27 EPNdB), and the mid-altitude range at 5, 000-pounds thrust ($\pm$2. 29 EPNdB). Of these, only the latter data are outside the program objective of equal or better than $\pm$1. 5 EPNdB 90 percent confidence limits.

TABLE 4
CONFIDENCE LIMITS

THRUST, F_N/δ (LB)	ALTITUDE RANGE (FEET)	ALTITUDE TO WHICH DATA ARE NORMALIZED, (FEET)	NO. OF DATA POINTS	90 PERCENT CONFIDENCE LIMITS
15,000	400-680	500	3	±1.27
	1065-1642	1500	6	±0.61
	2120-5440	3000	10	±0.84
10,000	480-816	600	6	±0.51
	1130-1630	1500	6	±0.66
	5234-8417	7000	9	±0.35
6,000	446-840	600	6	±0.71
	1147-1646	1500	6	±2.20
	2500-5280	4000	12	±0.74
3,200	323-412	370	6	±0.71
2,000	480-1940	1000	11	±0.79

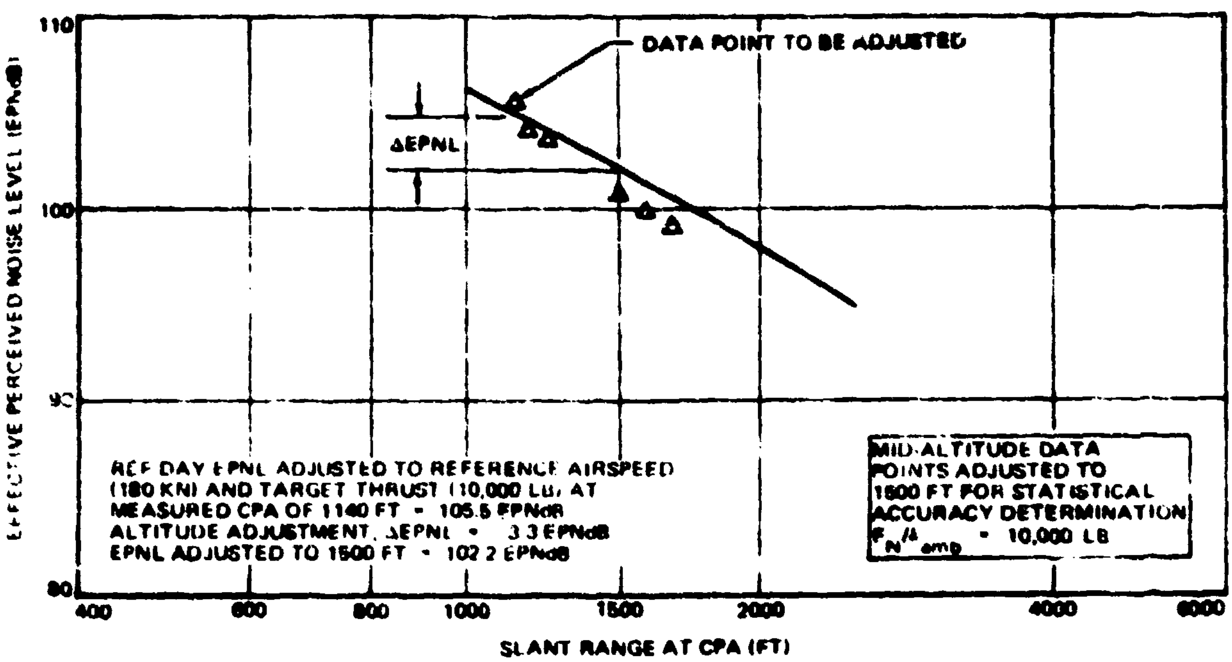


FIGURE 21. DATA POINT ALTITUDE ADJUSTMENT

The three low altitude data points at 15,000-pounds comprise the group giving ±1.27 EPNdB confidence; although the scatter of these points, as seen in Figure 14, does not appear excessive. Figure 14 also shows the three 5000-pound data points near 1600 feet, which when grouped with the three data points near 1350 feet (all adjusted to 1500 feet) result in the largest confidence interval of ±2.29 EPNdB. The scatter is evident in the EPNL plotted data but cannot be accounted by variations in airspeed or thrust.

The data for long distance and low thrust (2,000-pounds) showed very favorable results as reflected in the confidence limits.

4.5 LATERAL NOISE ATTENUATION ADJUSTMENT

Although not initially a test objective, a brief study was made into methods of presenting the effects of lateral noise attenuation, including EGA, and the manner in which far sideline distances and low airplane altitudes combine to produce lower-than-expected noise levels. Other studies (References 5 and 6) have suggested a fan plot or "ladder technique" for presenting adjustments to EPNL values to account for EGA effects. Each plot, however, is limited to a specific power setting, thus requiring several plots and considerable interpolation to determine off-design values. As a result a method is suggested as a procedure to compute EPNL's for sideline locations. This method, Figure 22, is based on the relationship

$$EPNL = EPNL_N - 10 \log_{10} \frac{V}{V_{REF}} - LNA$$

where

EPNL = normalized EPNL, EPNdB

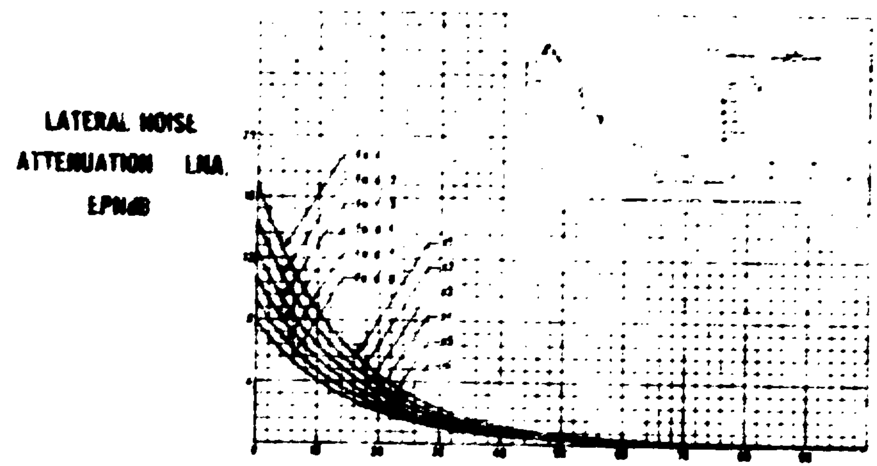
V = aircraft velocity

V_{REF} = reference aircraft velocity

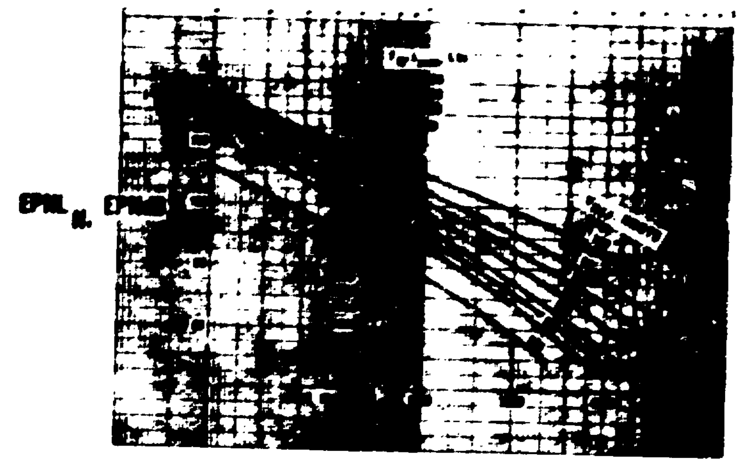
LNA = lateral noise attenuation, EPNdB

LATERAL NOISE ATTENUATION AS A FUNCTION OF ELEVATION ANGLE

$$\boxed{LNA = ke^{-x} = f(F_N/\delta_{amb}, \beta)}$$



NORMALIZED EPNL AS A FUNCTION OF CPA



$$\boxed{EPNL = EPNL_N - 10 \log \frac{V}{V\ REF} - LNA}$$

NOTE: ALL LEVELS ARE FOR PRESENTATION PURPOSES ONLY!

FIGURE 22. SUGGESTED PROCEDURE TO COMPUTE EFFECTIVE PERCEIVED NOISE LEVELS FOR SIDELINE LOCATIONS

and

$$LNA = ke^{-x} = f(F_N/\delta_{amb}, \beta)$$

Figure 22 is presented as a suggested method with no attempt made to provide quantitative values.

4.6 VERTICAL PROPAGATION EFFECTS

Sound propagating through the atmosphere is subject to uniform spreading losses that follow the inverse square law of spherical divergence and atmospheric absorption (or "excess attenuation"). Reference 2 was issued by the SAE as a recommended practice for determining atmospheric absorption as a function of temperature and humidity and applying adjustments to determine standard-day noise levels. Subsequent to its issuance, APR 866 was subject to critical evaluation. However, at the present time, it is the accepted method used to meet the requirements for FAR Part 36 aircraft noise certification. Therefore, all noise levels presented in this report are based on the procedures of ARP 866. This required the use of surface weather conditions (temperature and relative humidity measured at 10 meters above the ground) and adjusting the measured data to reference-day values (77°F and 70-percent relative humidity).

It was an objective of this study to investigate what effects variations in temperature and relative humidity along the entire noise propagation path might have on the determination of the reference-day noise levels.

The method followed was to segment the sound path in horizontal strata from the noise source (aircraft) to the measurement location. For each segment, the average weather conditions were determined from the information provided by Figure B-4 of Appendix B. A computer subroutine from the E2QH program (see Paragraph 3.3.1) was used to determine the ARP 866 adjustments in the sound path distance in each segment; the summation of these adjustments was applied to the measured data, and a reference-day noise level spectrum plotted. Shown in Appendix G are tabulations of comparisons between EPNL values determined by the layered-weather and the FAR, Part 36 methods (Table G-1). Also shown in Figure G-1, are representative examples of the 1/3-octave band spectra plots.

The reference-day EPNL values determined by the layered weather method varied from values determined by the FAR, Part 36 method by +0.3 dB (for a low altitude cutback thrust flight) to +2.9 dB (for an intermediate altitude approach thrust flight). Generally, the 1/3-octave band spectra determined by both methods, at time of PNLTM, were quite similar, as shown for Run 11A on Page 151. However, as seen for Run 33B on Page 156, large differences did occur. This anomoly is unexplained and therefore, further research into the effects of sound-path weather variations is needed before this technique can be applied.

SECTION 5
SUMMARY AND CONCLUSIONS

Flyover-noise tests of a Douglas DC-8-61 were conducted at Yuma, Arizona during 6-8 November 1973. Noise data from the flight tests were analyzed and derivations of the normalized EPNL and A-weighted sound level variations with slant range were made. The noise levels for thrust settings from 2000-pound approach thrust to the JT3D-3B takeoff thrust and slant ranges from 200 to 10, 000 feet (or minimum noise levels of 80 EPNdB or 65 dBA) were plotted. The data used were from measurements of the overhead-noise levels and did not include any lateral noise attenuation effects.

Comparison of the plotted EPNL and A-weighted sound levels with the respective plots of the data from Phase I indicates values that are lower than previously reported. The EPNL's range from about 4 to 12 EPNdB and the A-weighted sound levels 2 to 9 dBA lower than the values shown in Reference 1, with the larger differences occurring at the longer slant ranges.

From a comparison of the measured overhead and to the sideline noise levels for several power settings a significant relationship between lateral noise attenuation, the flyover elevation angle (β), and the surface distance to the side of the flight path (D) was found to exist. Both the elevation angle and the sideline distance are interrelated in the determination of lateral noise attenuation, but of the two factors, the angle of elevation is the most significant.

No significant asymmetry was noted in the measured test data to a sideline distance of 2500 feet.

The plots of the EPNL variation with distance to the sideline of the flight path exhibit a noticeable flattening with increases in aircraft altitude for a given thrust setting. This is because of the relatively large changes in sound path distance, with altitude increases, for the near centerline locations as opposed to only minor changes in sound path distance to the more distant sideline location, for a comparable increase in altitude.

The statistical accuracy of the data used in determining the plots of EPNL variation with slant range was evaluated in terms of 90-percent confidence limits. The results indicate the confidence limits of EPNL to be less than ±1.0 EPNdB for most thrusts and altitudes; this was also the case for the DC-8-61 data reported in the Phase I study. For the 5000-pound thrust setting at mid-altitudes, the calculated limits were ±2.29 EPNdB and for 15,000-pound thrust the limits were ±1.27 EPNdB. The larger confidence limits calculated for those two thrusts result from variations in the data that are unexplained at this time.

Methods of plotting lateral noise attenuation adjustments were studied and a suggested procedure to compute EPNL's for sideline locations was presented.

Vertical propagation effects were studied and noise level adjustments for sound-path weather variations were estimated. This estimate indicated that a 1 to 2 EPNdB difference might occur for low altitude (less than 2000 feet) flyover noise when weather corrections are made on the basis of sound-path weather rather than surface weather.

The noise levels determined for the DC-8-61 as a result of the Phase II fly-over-noise tests are generally lower than those previously reported in Phase I. A review was made of the methods used in the two tests in data acquisition, processing, and analyses. The review identified three differences in the analytical procedures that contributed to the variances and it identified several other factors, including sound-path weather variations, that might explain the remainder of the difference.

APPENDIX A
EVALUATION OF DATA ACQUISITION

The flyover-noise measurement runs attempted for Phase II of the Aircraft Noise Definition Program are listed in Table 1 of Section 2. The exact space positioning of all microphone locations is shown in Table A-1. Noise data were recorded for all runs. However, only the data listed in Table A-2 were reduced and used in this report.

All Flight 1 ADDS data contain varying degrees of erroneous data for all airplane parameters. Most of the erroneous data is recognizable; however, other necessary operational data are unavailable for Flight 1. Therefore, none of the Flight 1 data were used in the analysis reported in Section 4.

The acoustic data for microphone sideline distances of 5, 000 feet or more are severely limited by the levels of ambient and microphone system noise, the system noise consisting of extraneous high-frequency signals. Where-ever possible, the extraneous high-frequency content was eliminated, and care was taken to use the lowest possible levels of valid ambient noise for each run.

The following runs had incomplete MALT space-positioning data: Runs 5, 6, 24, 25, and 27 through 34. The deficiencies were eliminated by manual position data input with a point every 2 seconds. The following techniques were used to interpolate for the incomplete MALT space-positioning data:

1. The available tracker altitude data were compared with the corresponding airplane pressure altitude obtained from ADDS data. Aircraft pressure altitude was corrected to correspond with tracker altitude, and the corrected pressure altitude was then used for missing tracker altitude data.

2. A similar technique was used for path speed, where indicated airspeed was adjusted to agree with tracker airspeed. The adjusted airspeed was used for the incomplete path speed data.

TABLE A-1

AIRPLANE FLYOVER NOISE TESTING MICROPHONE LOCATION COORDINATES

MEASUREMENT LOCATION	MICROPHONE LOCATION COORDINATES (FT)*		
	X	Y	Z
A	12082	221	2
B	6835	221**	-2
B (FLUSH)	6835	221**	-6
C	2460	219	2
D	-2802	219	-5
E	6483	2720	-1
F	6483	-228	8
G	7900	-4780	14
H	9600	-7582	15

*RELATIVE TO WEST END OF RUNWAY WITH ALL MICROPHONES (EXCEPT B FLUSH) 4 FEET ABOVE GROUND LEVEL

**EACH MICROPHONE LOCATIONED APPROXIMATELY 4 FEET IN LINE WITH THIS COORDINATE POINT (SEE FIGURE 8).

TABLE A-2

MATRIX OF FLYOVER NOISE TESTS
7 & 8 NOVEMBER 1973

FLIGHT CONDITION		RUN NO.	MICROPHONE LOCATIONS								
			A	B	C	D	E	F	G	H	8 FLUSH
T.O. CORRECTION	(THRUST/ENG = .38 T.O.	11	1	3	10	11	5	6	7	9	4F
	= 10,000 LB)	12	2	3	10	12	5	6	7	9	4F
		13	2	3	10	11	5	6	7	9	4F
		14	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
APPR CORRECTION	(THRUST/ENG = 2,000 LB)	15	2	3	10	12	5	6	7	9	4F
		16	N.P.	3	10	12	5	6	7	N.P.	4F
		17	2	3	10	12	5	6	7	9	4F
		18	2	3	10	12	5	6	7	9	4F
	= 5,000 LB)	19	2	3	10	12	5	6	7	9	4F
		20	2	3	10	12	5	6	7	9	4F
		21	2	3	10	12	5	6	7	9	4F
T.O. CORRECTION	(THRUST/ENG = .38 T.O.)	22	N.P.	3	10	12	5	6	7	9	4F
		23	N.P.	3	10	12	5	6	7	9	4F
		24	2	3	10	12	5	6	7	9	4F
		25	2	3	10	12	5	6	7	9	4F
2500 FT LEV FLT	(THRUST/ENG = 5,000 LB)	26	2	3	10	12	5	6	7	9	4F
		27	2	3	10	12	5	6	7	9	4F
5000 FT LEV FLT	(THRUST/ENG = .38 T.O.	28	2	3	10	12	5	6	7	9	4F
	= 10,000 LB)	29		3	10	12	5	6	7	9	4F
		30	2	3	10	12	5	6	7	9	4F
8000 FT LEV FLT	(THRUST/ENG = 10,000 LB)	31	2	3	10	12	5	6	7	9	4F
		32	2	3	10	12	5	6	7	9	4F
5000 FT LEV FLT	(THRUST/ENG = 5,000 LB)	33	2	3	10	12	5	6	7	9	4F
		34	2	3	10	12	5	6	7	9	4F
400 FT LEV FLT	(THRUST/ENG = 3,200 LB)	37	2	3	10	12	5	6	N.P.	N.P.	4F
		38	2	3	10	12	5	6	7	N.P.	4F

NOTES: 1. N.P. = NOT TO BE PROCESSED
2. FOR EACH RUN THE NUMBER BENEATH EACH MIC. LOC. IS MIC. NO. AND INDICATES A PROCESSED RECORDING

3. The X-position of the airplane was calculated from the X-component of path speed.

4. Lateral position was obtained by extrapolating available MALT lateral-position data.

The flyover-noise data "drop-out" due to ambient and system noise was anticipated, and the amount of valid data obtained compared to that attempted was high (greater than 90-percent). Consequently, the objective of the test was well satisfied.

APPENDIX B

YUMA, ARIZONA, TEST-SITE WEATHER CONDITIONS

The dry-bulb temperature, relative humidity, and wind speed and direction weather conditions were recorded during the flyover-noise testing at ground level and by upper-air soundings. The latter data were obtained by the National Weather Corporation with the following techniques:

1. Temperature and relative humidity were obtained from continuous recordings from a instrumented light aircraft.

2. Wind speed and direction were obtained from theodolite tracking of weather balloons.

The test day surface and sound-path weather conditions are summarized as follows:

Figure B-1.	Summary of Frequency of Occurrence of Surface Weather Conditions within FAR Part 36 Limits.
Figure B-2.	Summary of Temperature Inversion Characteristics by Month.
Figure B-3.	Plots of Measured Test Day Surface Weather.
Table B-1.	Summary of Test Day MART Weather Measurements.
Figure B-4.	Plots of Upper-Air Sound-Path Weather Data.

The data from Figure B-4 was used in the layered weather determinations discussed in Section 4.6 and the data presented in Appendix C.

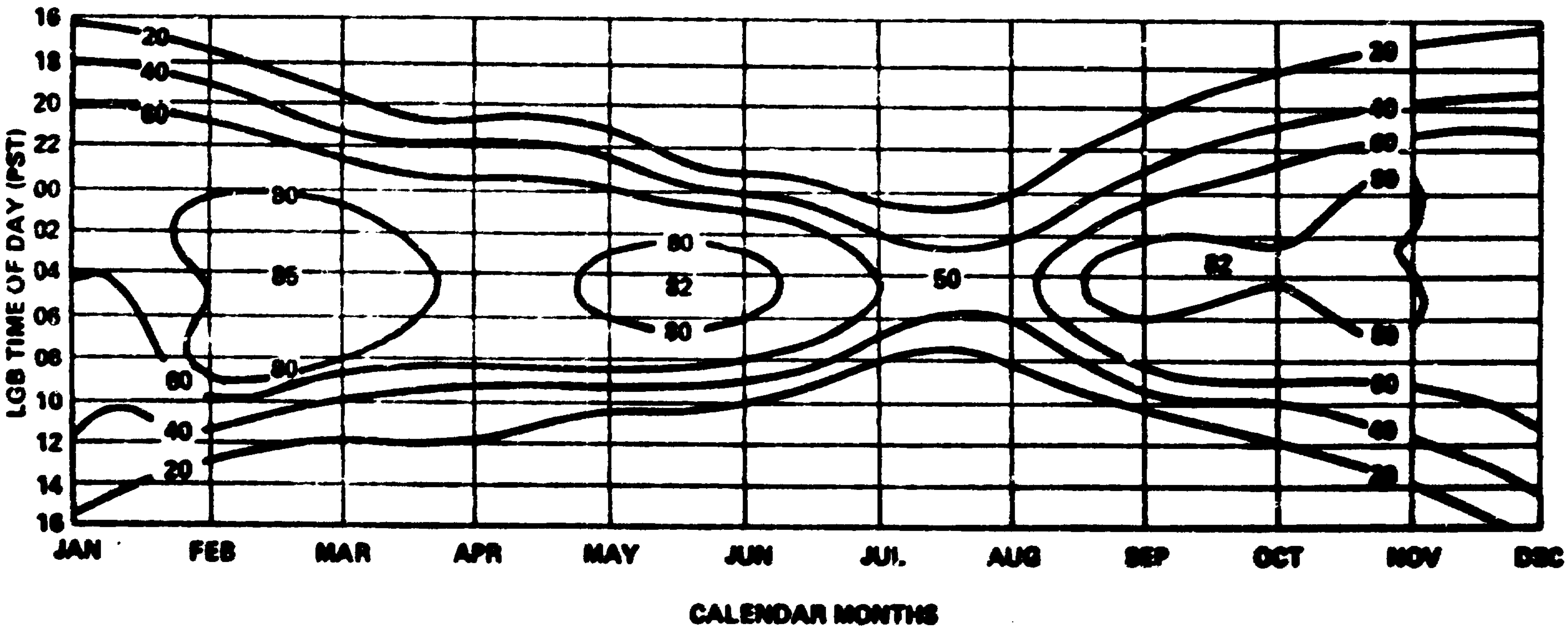


FIGURE B-1. SURFACE WEATHER CONDITIONS WITHIN FAR 36 LIMITS

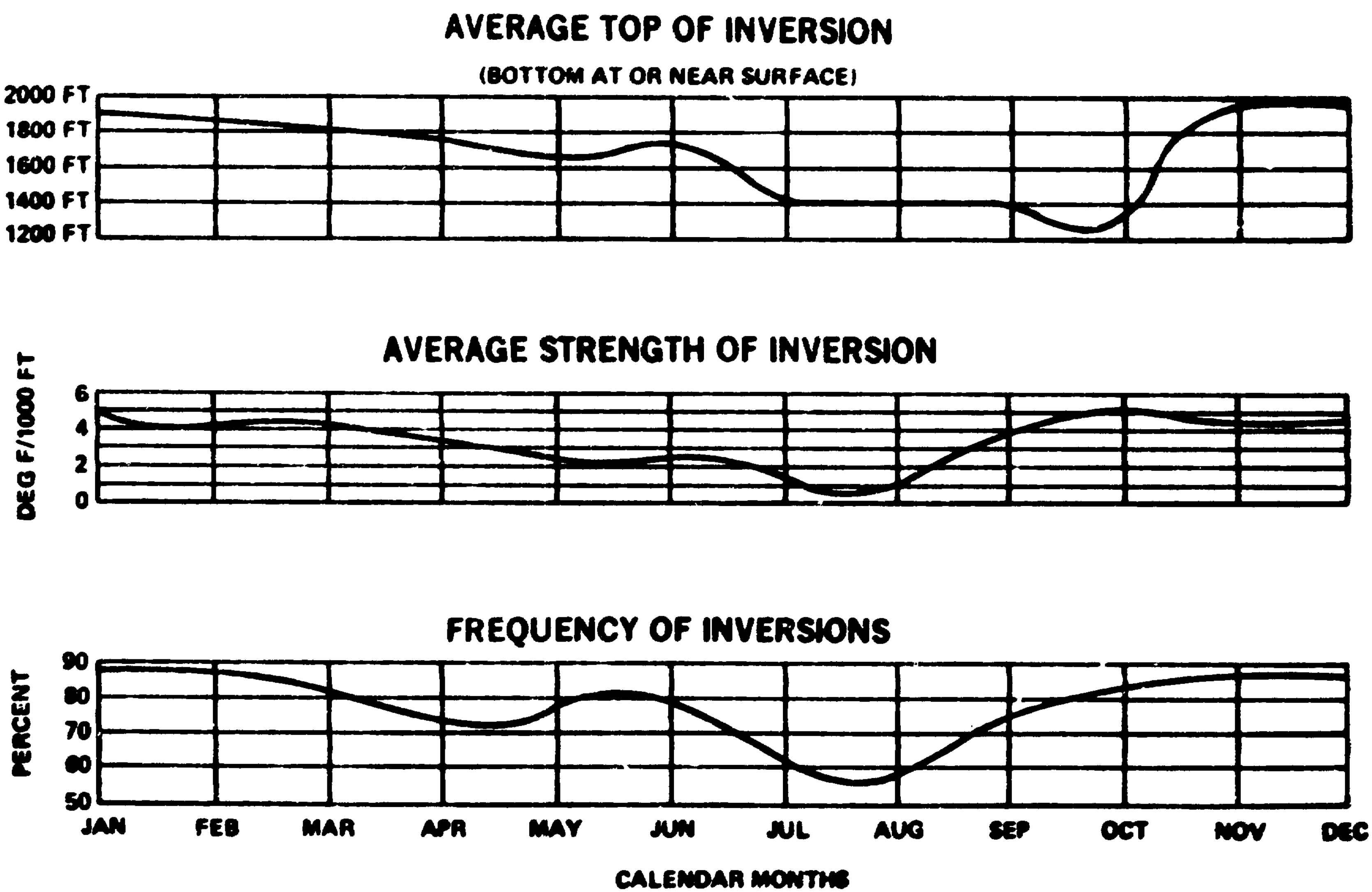


FIGURE B-2. TEMPERATURE INVERSION CHARACTERISTICS

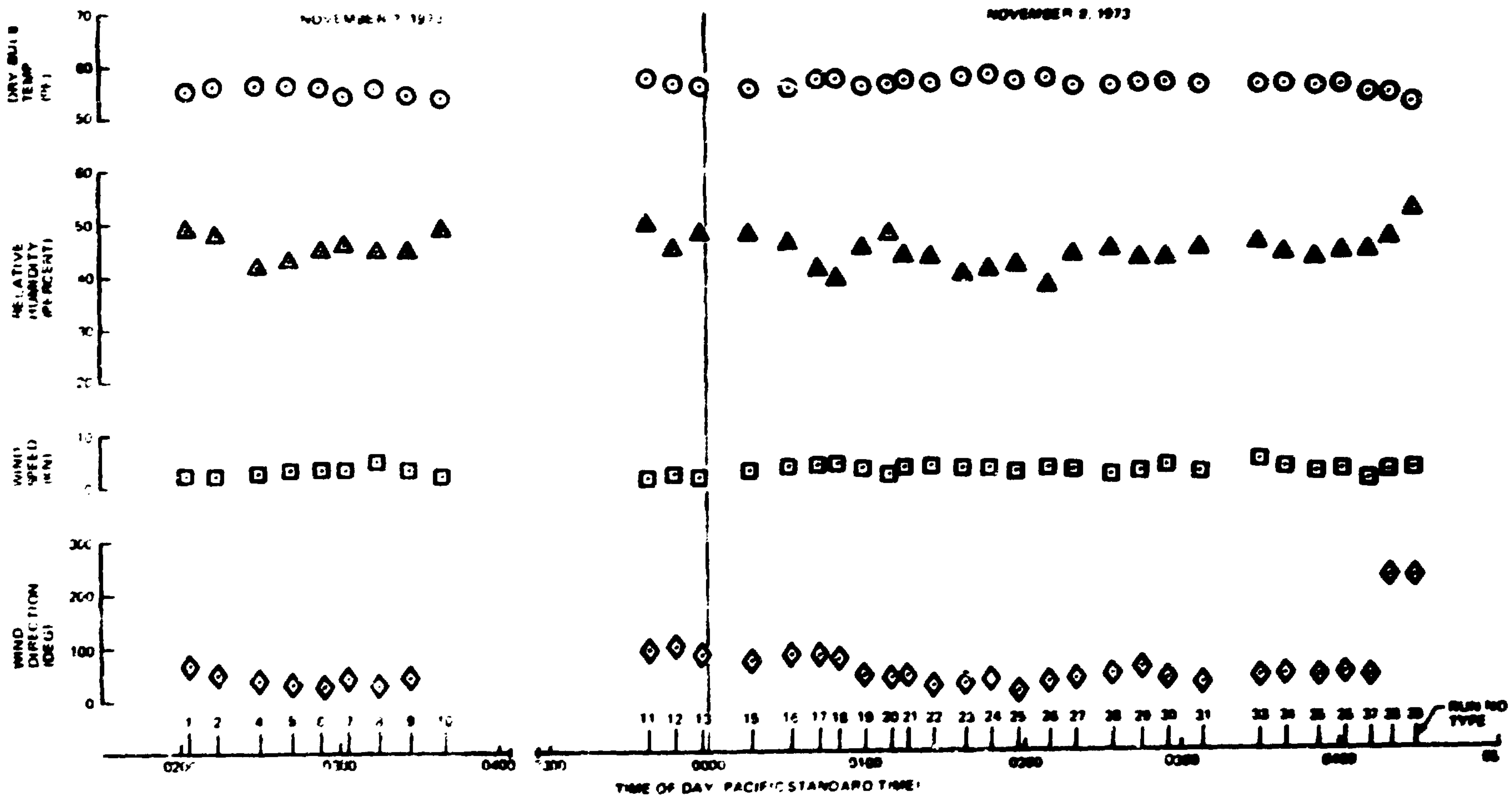


FIGURE B-3. SURFACE WEATHER – DC-8-61 (JT3D-3B) AIRCRAFT DEFINITION

TABLE B-1

MOBILE ATMOSPHERIC RECORDING TOWER WEATHER DATA

TEST TITLE DC-8-61 F/O NOISE DEFINITION DATE 11-6/7/8-73 WEATHER MODEL DC-8-61 REG NO [illegible] JOB NO [illegible]

(10 METER HEIGHT)

RUN NO	TIME OF DAY	MART D.B. TEMP (°F)	MART W.B. TEMP (°F)	MART R.H (%)	PSYCHRON D.B. TEMP (°F)	PSYCHRON W.B. TEMP (°F)	PSYCHRON R.H (%)	WIND DIR (DEG)	WIND VEL (MPH)	STA PRESS (IN HG)
CAL	[illegible]	[illegible]	47.8		[illegible]	47.8				
1	[illegible]	[illegible]	46.5	40				70.0	26 KN 30	29.810
[illegible]	0214	56.5	[illegible]	40				50.0	26 KN 30	29.810
4	0230	56.6	46.2	42				40.0	30 KN 35	29.810
5	0242	56.5	46.2	41				35.0	35 KN 40	29.810
6	0251	56.0	46.0	45				30.0	35 KN 40	29.810
7	0301	56.5	46.0	46				42.0	35 KN 40	29.800
8	0315	55.8	46.8	45				30.0	52 KN 60	29.800
9	0327	56.8	45.2	45				46.0	35 KN 40	29.800
10	0340	51.8	44.8	40				80.0	22 KN 25	29.800
CAL	[illegible]	61.4	49		61.2	44.8				
CAL	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]				
11	[illegible]	[illegible]	[illegible]	50				95	17 KN 20	29.775
12	2340	56.8	46.5	45				100	22 KN 25	29.776
13	2350	56.2	46.8	40				85	17 KN 20	29.775
15	0017	56.8	46.5	40				75	30 KN 35	29.770
16	0032	56.0	46.2	46				85	35 KN 40	29.770
17	0041	57.2	46.2	41				85	39 KN 45	29.770
18	0050	57.8	46.2	[illegible]				75	43 KN 50	29.770
19	0100	56.0	46.2	45				45	35 KN 40	29.776
20	0110	56.4	46.8	48				42	22 KN 25	29.776
21	0116	57.2	46.8	44				46	35 KN 40	29.776
22	0126	56.5	46.2	43				75	39 KN 45	29.776
23	0138	57.8	46.5	40				30	35 KN 40	29.776
24	0148	58.2	46.8	41				35	35 KN 40	29.776
25	0158	57.0	46.2	42				15	26 KN 30	29.776
26	0210	57.5	45.5	38				32	35 KN 40	29.750
27	0220	56.0	[illegible]	44				40	30 KN 35	29.750
28	0236	56.8	45.8	46				50	21 KN 25	29.750
29	0245	56.5	45.8	43				60	26 KN 30	29.750
30	0255	56.5	46.0	43				38	39 KN 45	[illegible]
31	0308	56.8	45.8	40				30	26 KN 30	29.750
32	0317	56.2	45.8	41						
33	0330	56.0	46.2	46				40	48 KN 55	[illegible]
34	0340	56.0	45.8	44				4	[illegible]	[illegible]
35	0352	56.8	45.5	43				43	[illegible] KN 30	[illegible]
36	0402	56.0	45.8	44				[illegible]	30 KN 35	29.750
37	0412	54.8	45.2	46				40	09 KN 10	[illegible]
38	0422	54.2	45	47				225	[illegible] KN 10	[illegible]
39	0429	52.8	44.8	52				225	30 KN 35	29.750
CAL	0500	48.6	44.1		46.7	44.6				

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev

Wind direction is heading from which wind is blowing referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 6 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 2100 WIND 2035

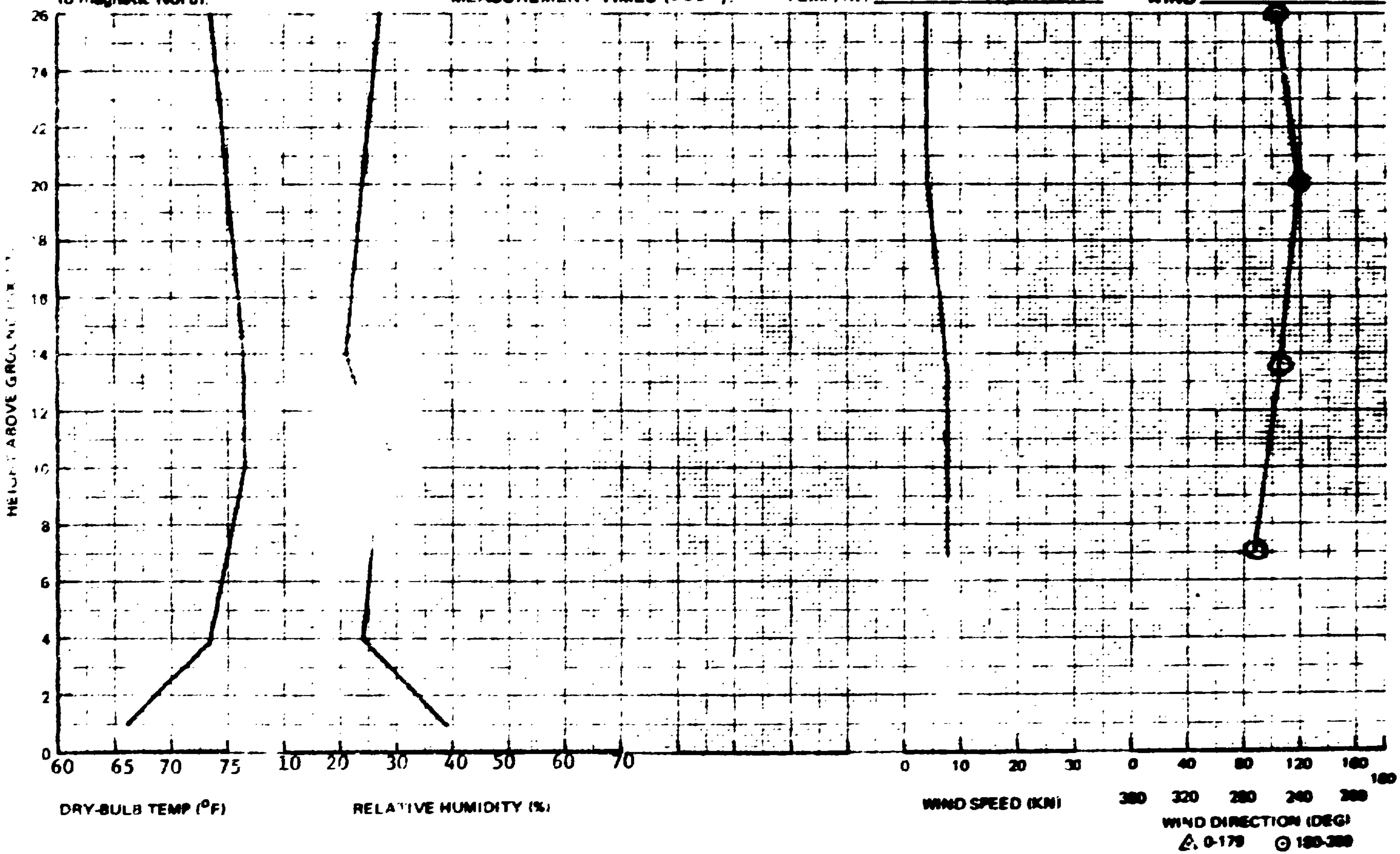


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 R...

Wind direction is heading from which wind is blowing referenced to magnetic North.

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0145 WIND 0225

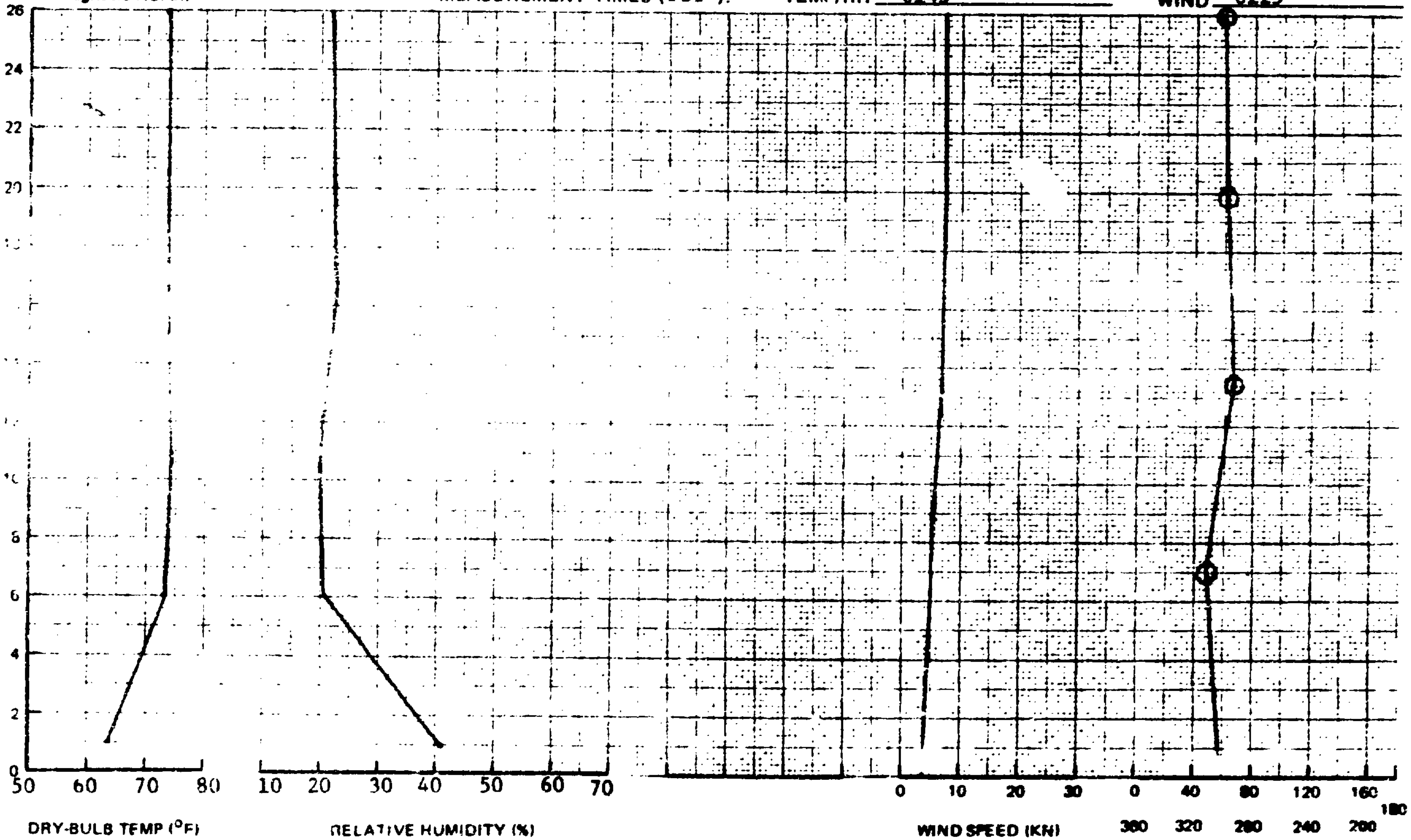


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N80U7U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST). TEMP/RH 0145 WIND

NOTES: Atm. abs. coeff ... B value of SAE ARP 866 ...

Wind direction is heading from which wind is blowing referenced to magnetic North

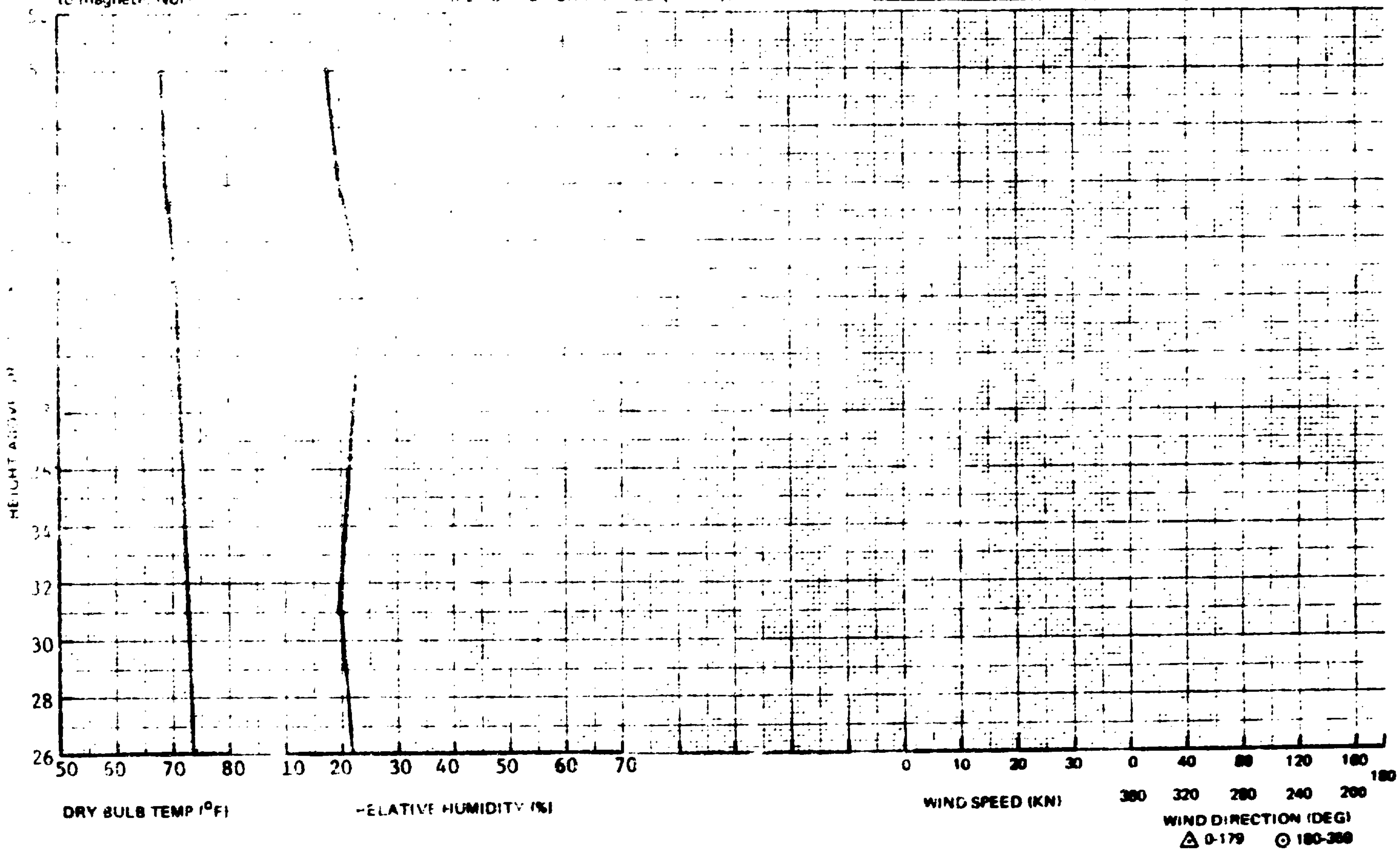


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8037U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0255 WIND

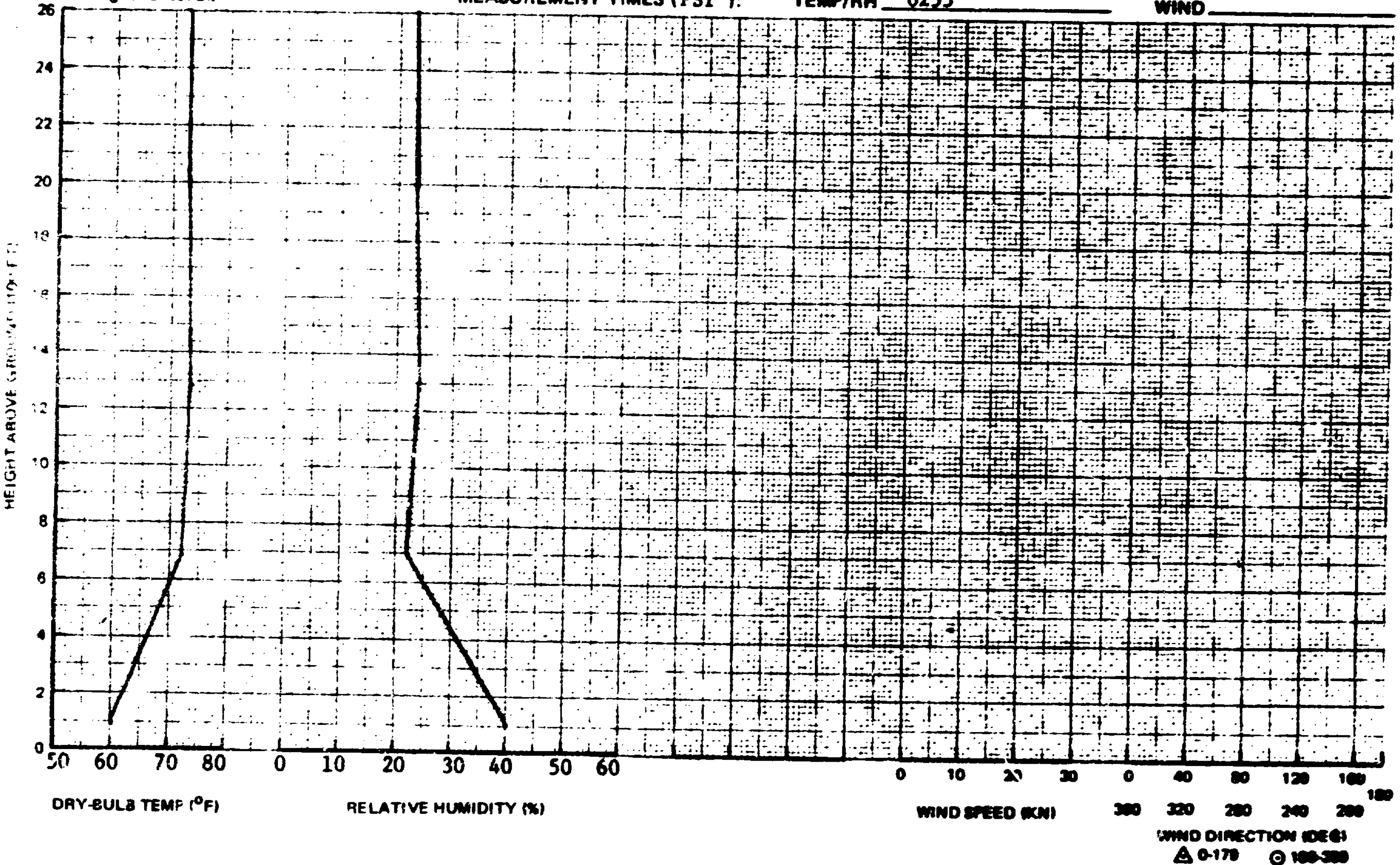


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0255 WIND

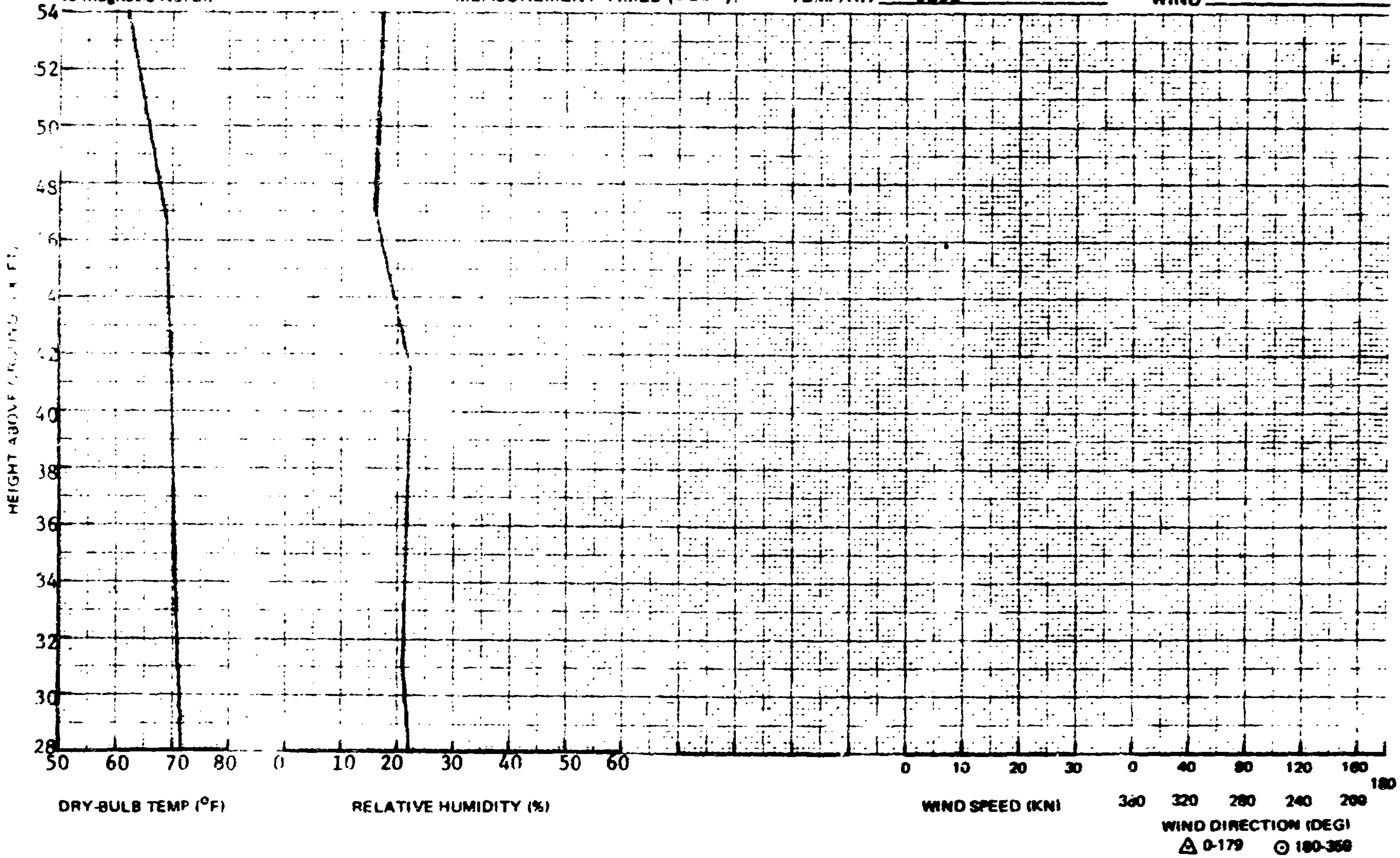


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0255 WIND

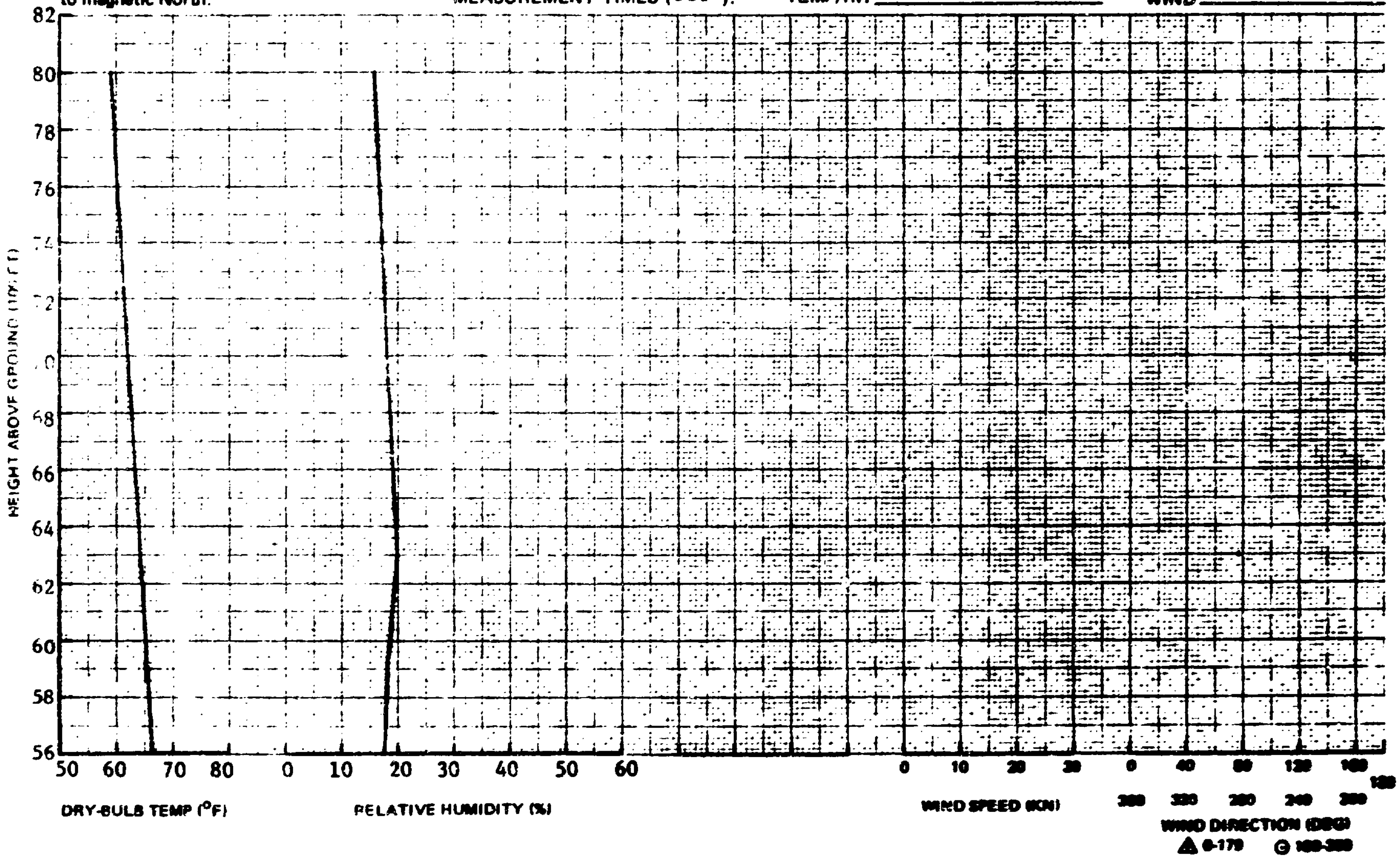


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 2055 WIND 2040

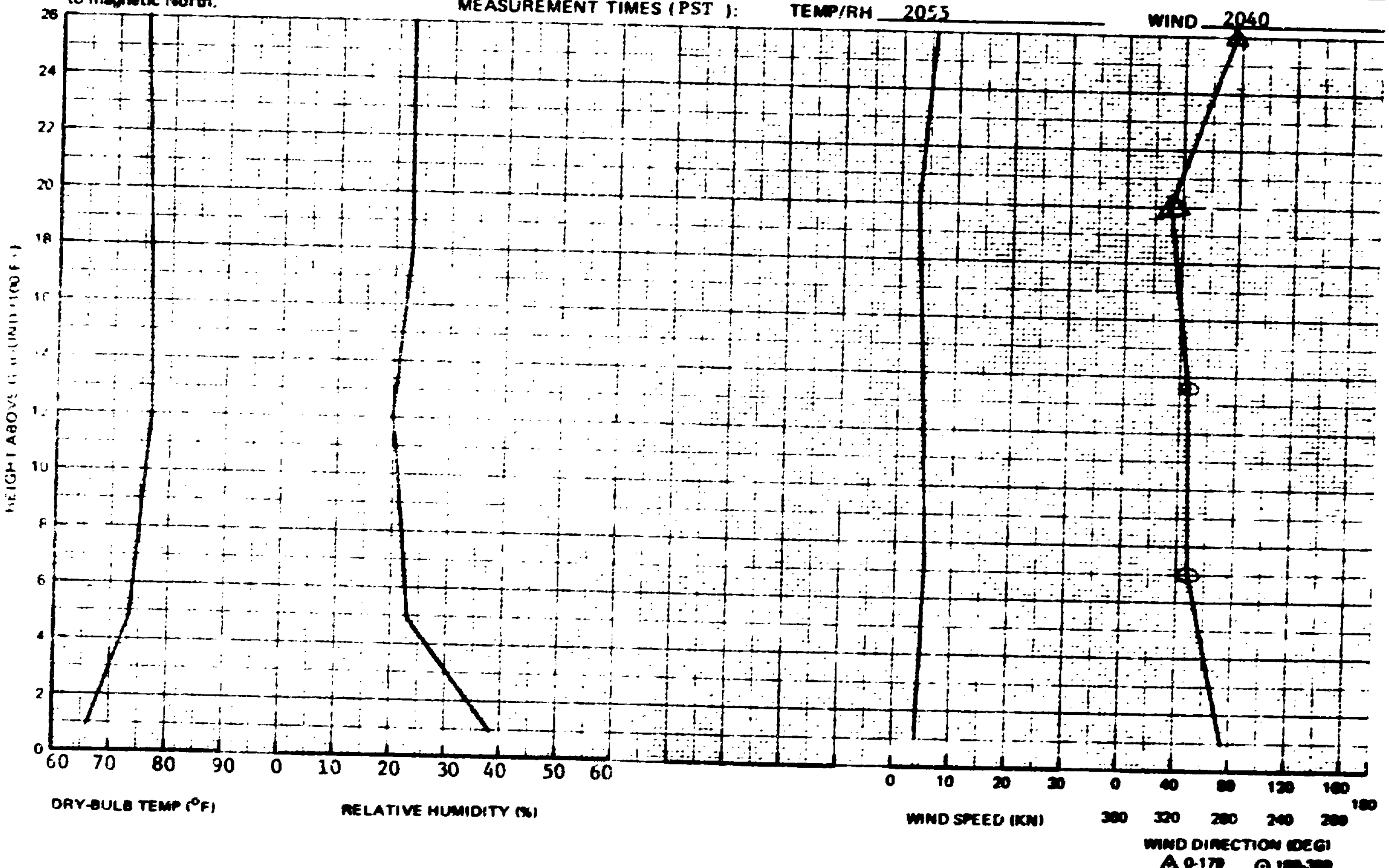


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1.3 C.B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 2055 WIND 2040

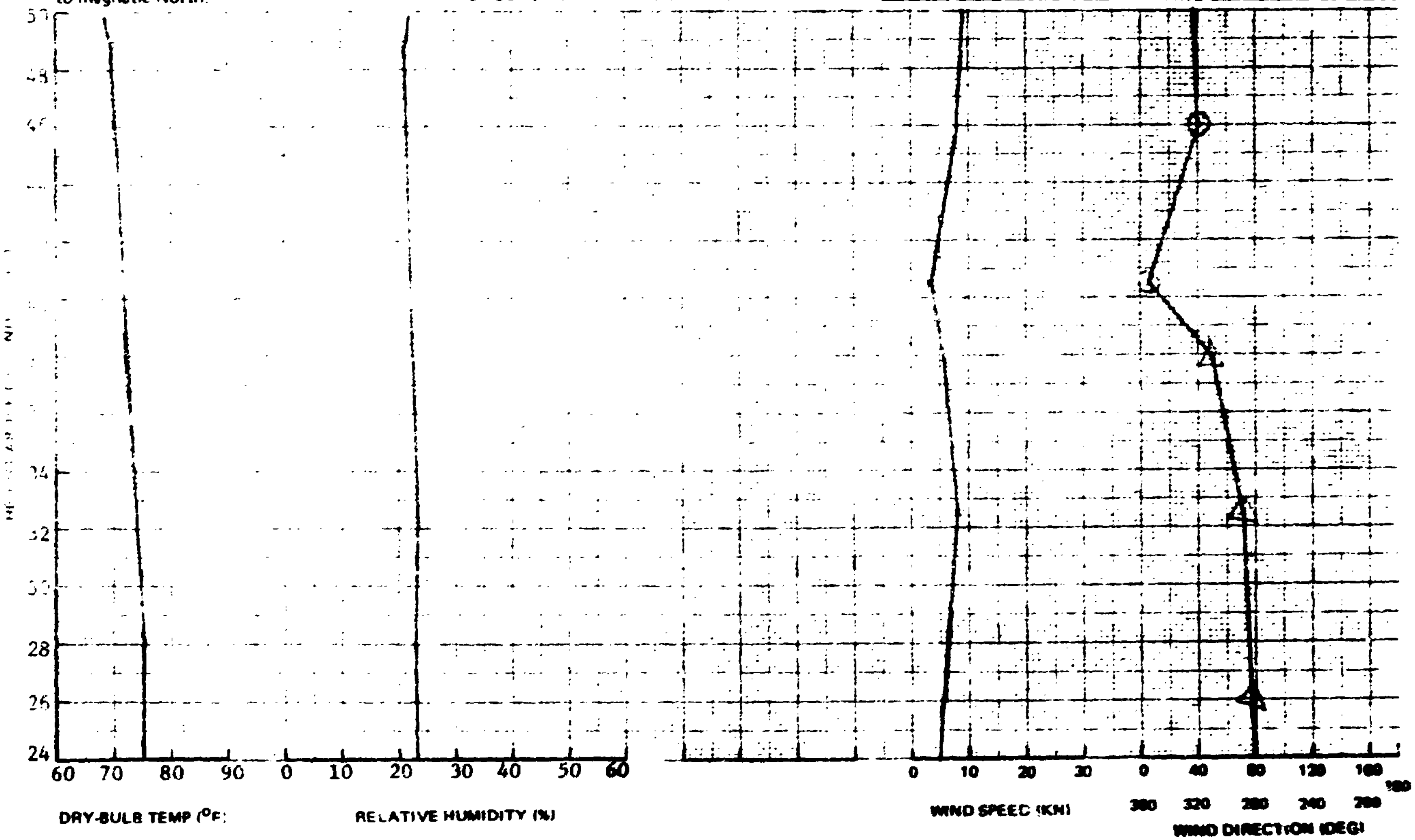


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev

Wind direction is heading from which wind is blowing referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 2055 WIND 2040

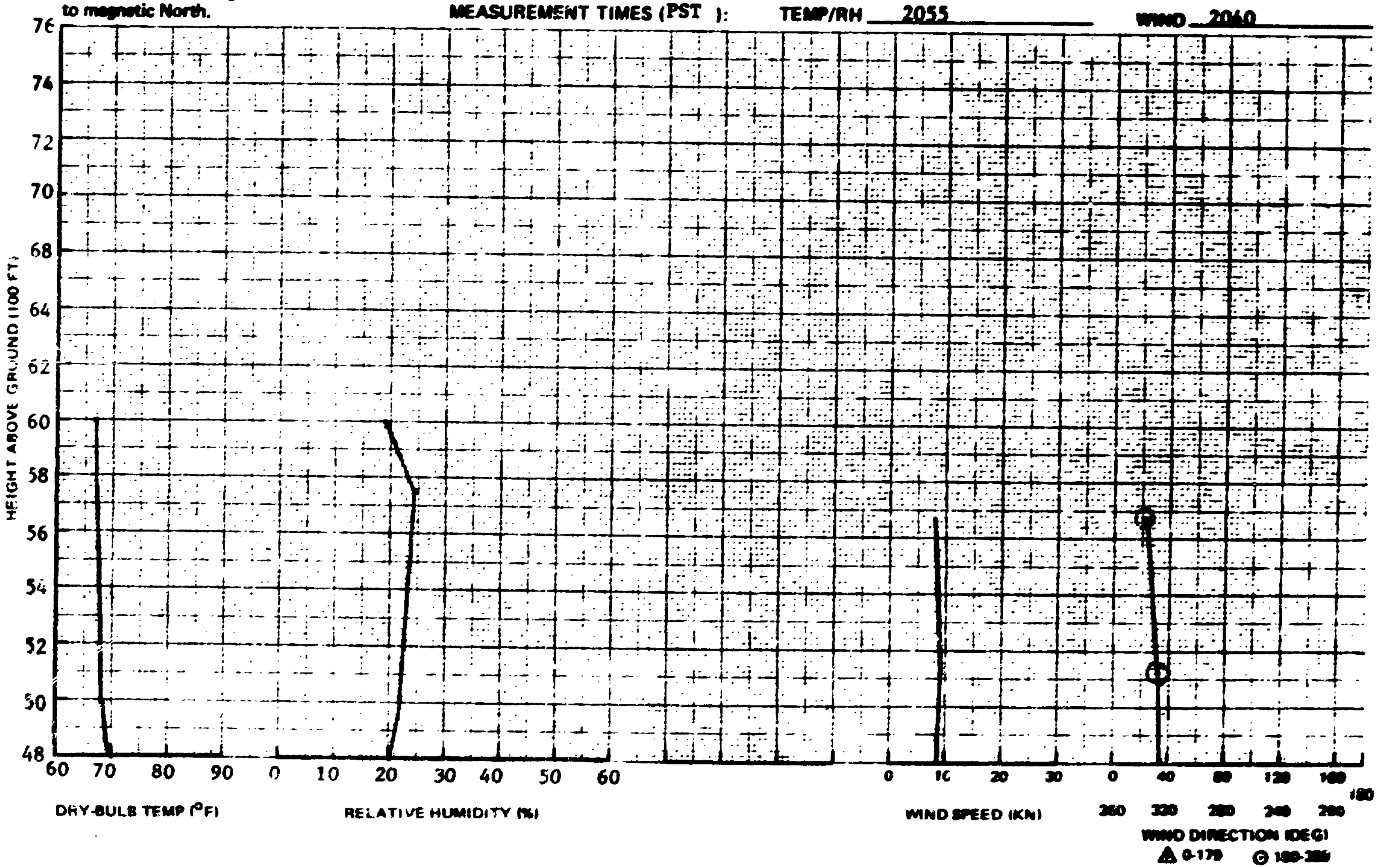


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST) TEMP/RH 2320 WIND 2355

NOTES: Atm. abs coeff. ... value of SAE ARP ...

Wind direction is head ... which wind is blowing referenced to magnetic North

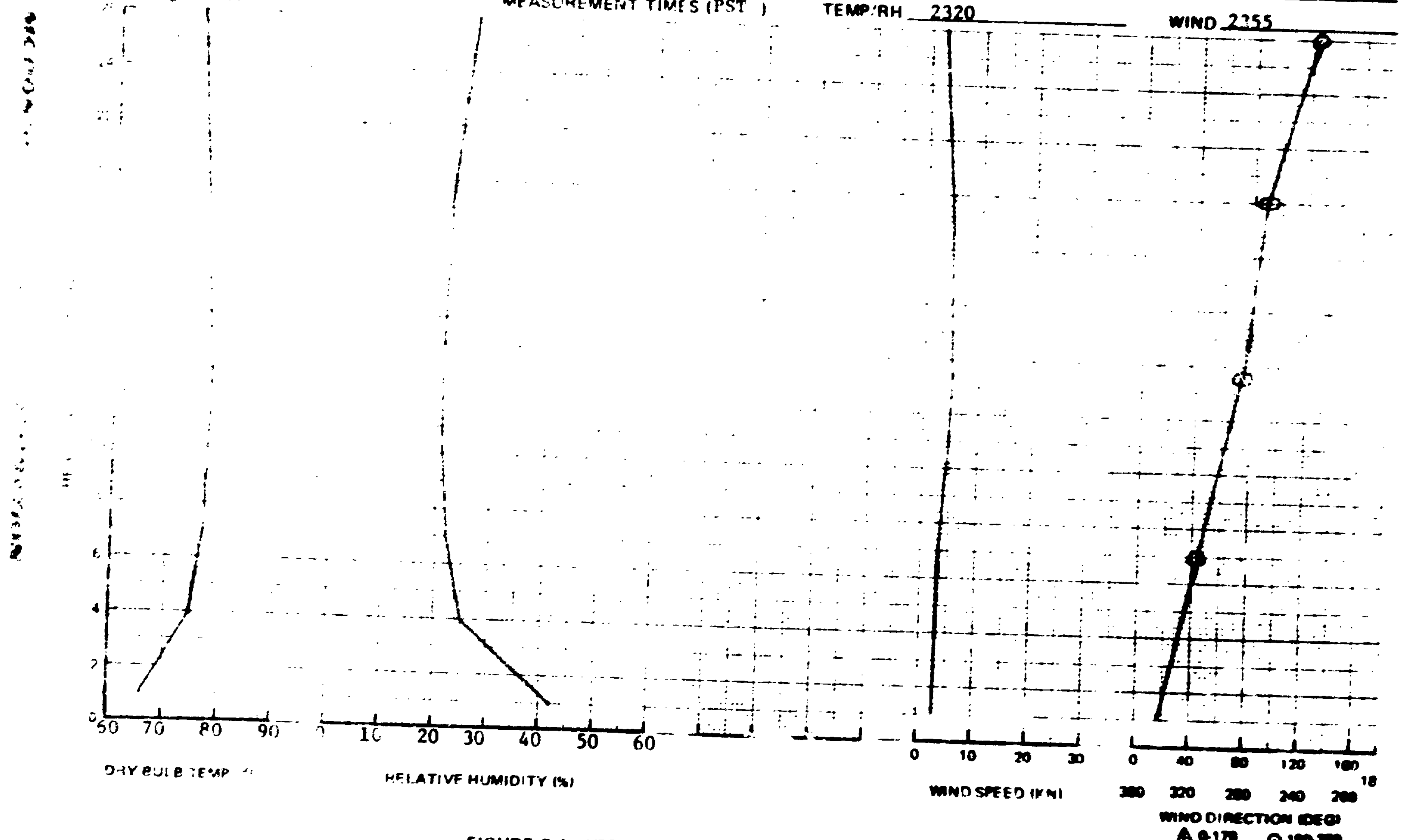


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 7 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 2320 WIND 2355

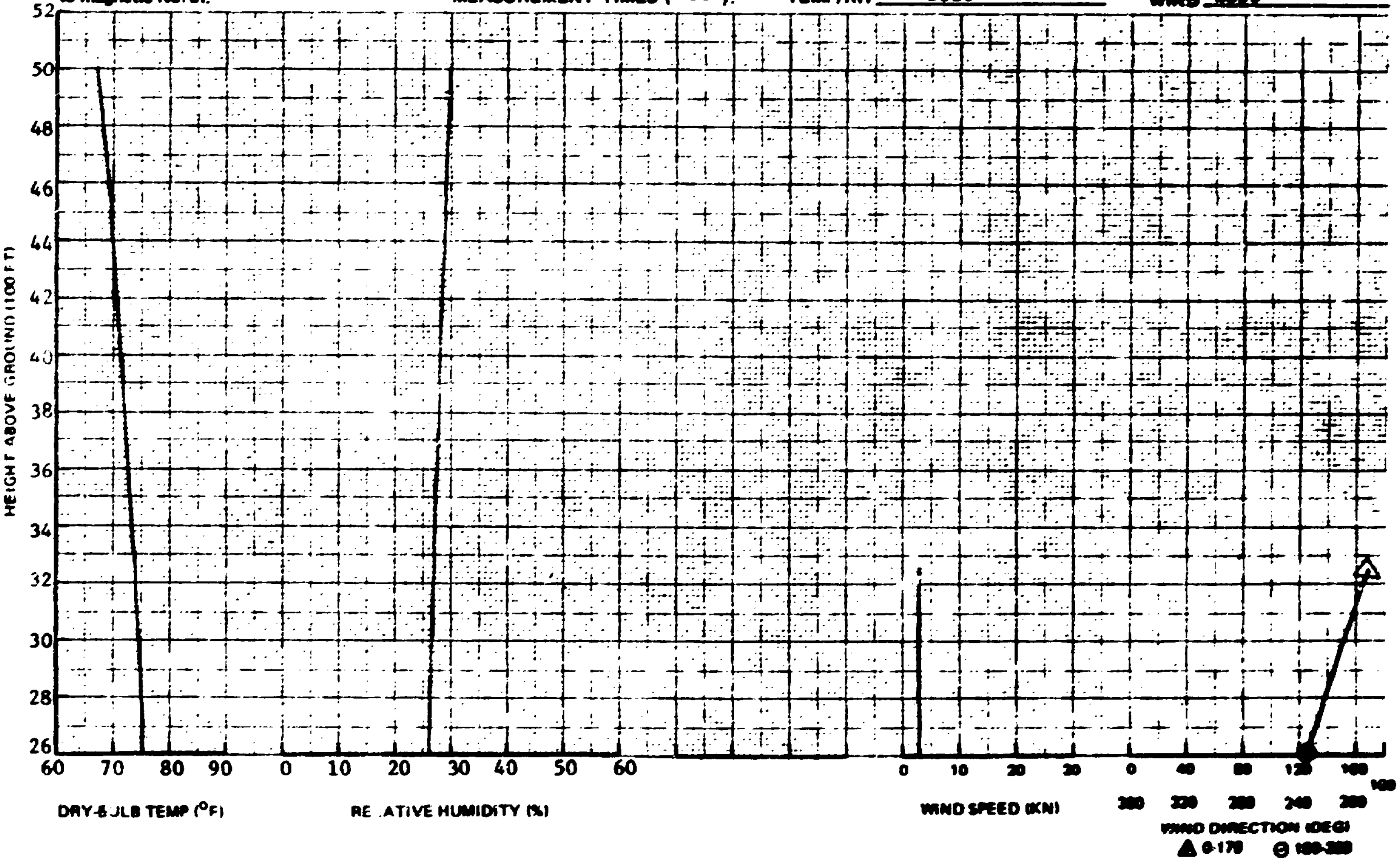


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES Atm. abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Re.

Wind direction is heading from which wind is blowing, referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST) TEMP/RH 0040 WIND 0125

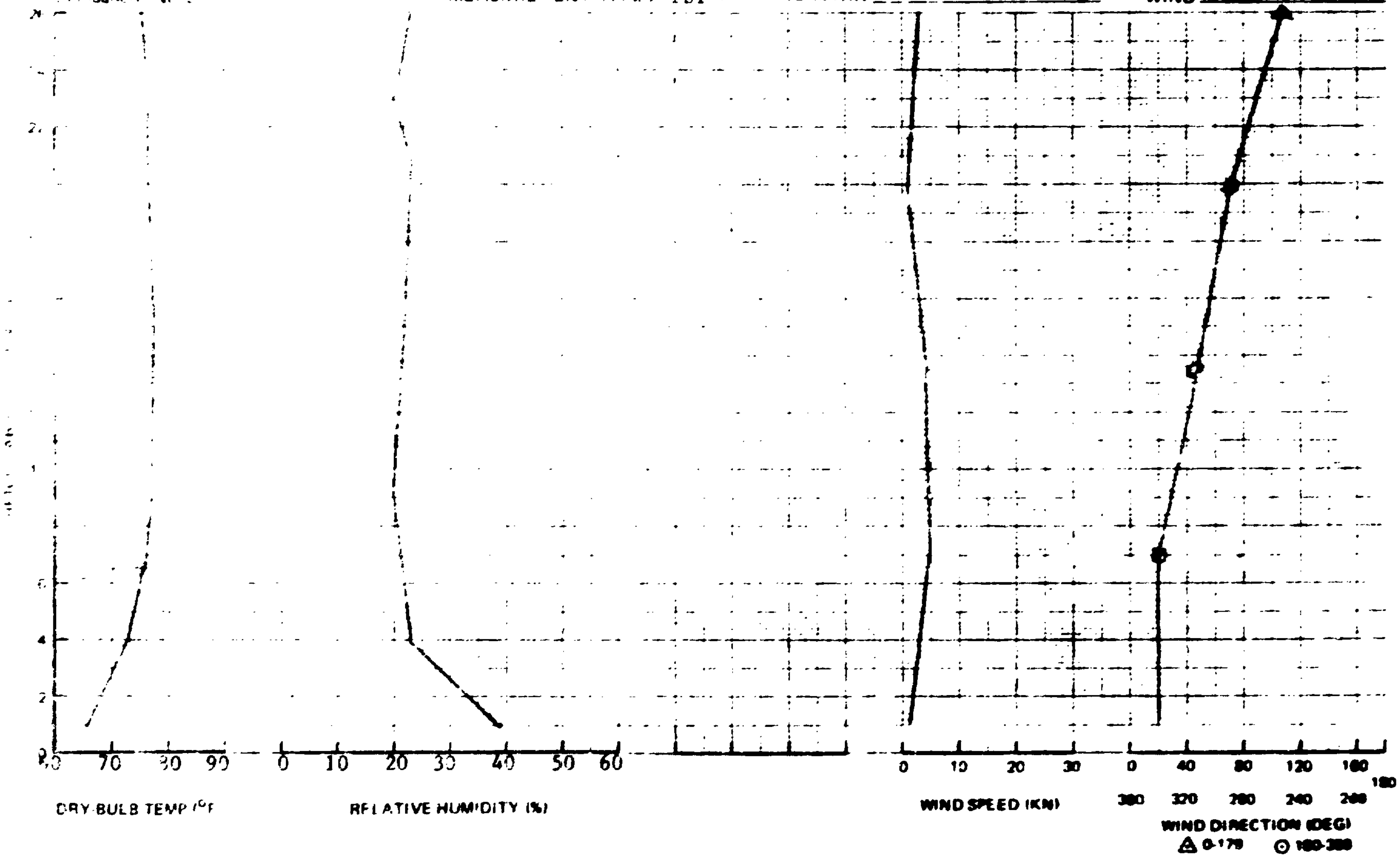


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8067U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0040 WIND 0175

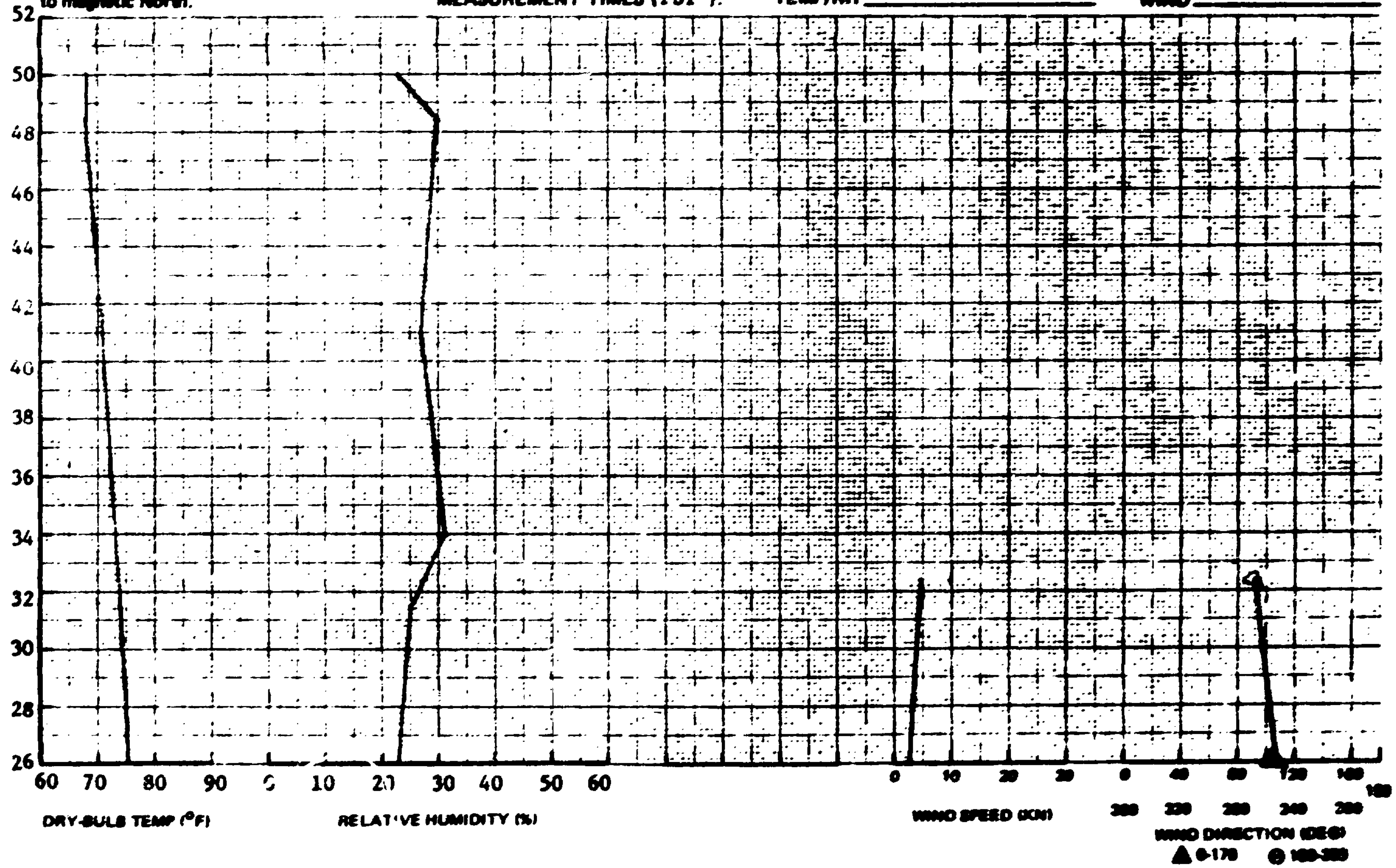


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTES: Atm abs coeff is ... D.B. ... of SAE ARP 866 1970 ...

Wind direction is heading from which wind is blowing referenced to magnetic North

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 PEG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0205 WIND 0255

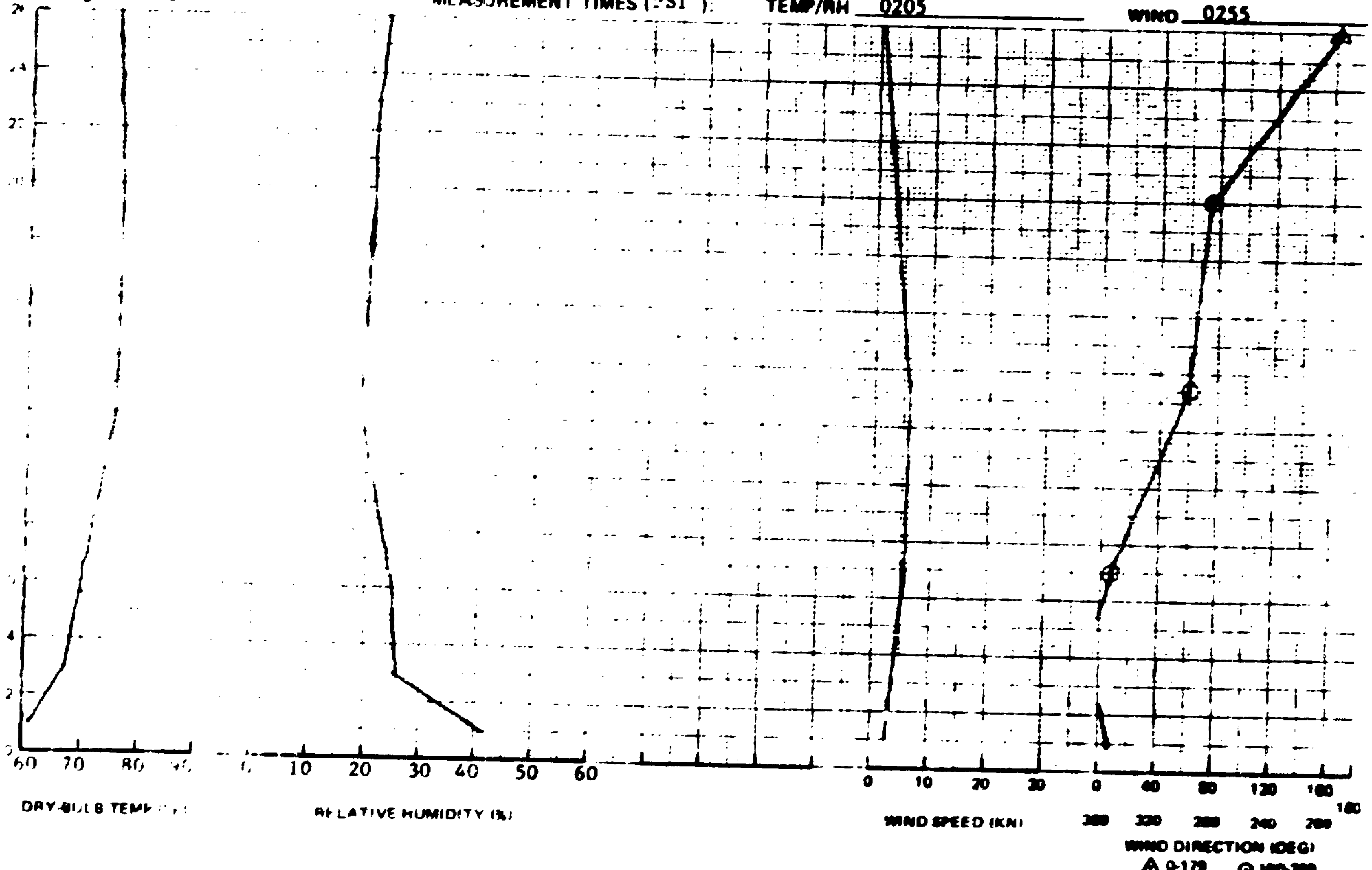


FIGURE B-4 UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTES: Atm abs coeff is 1/3 O B value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0205 WIND 0255

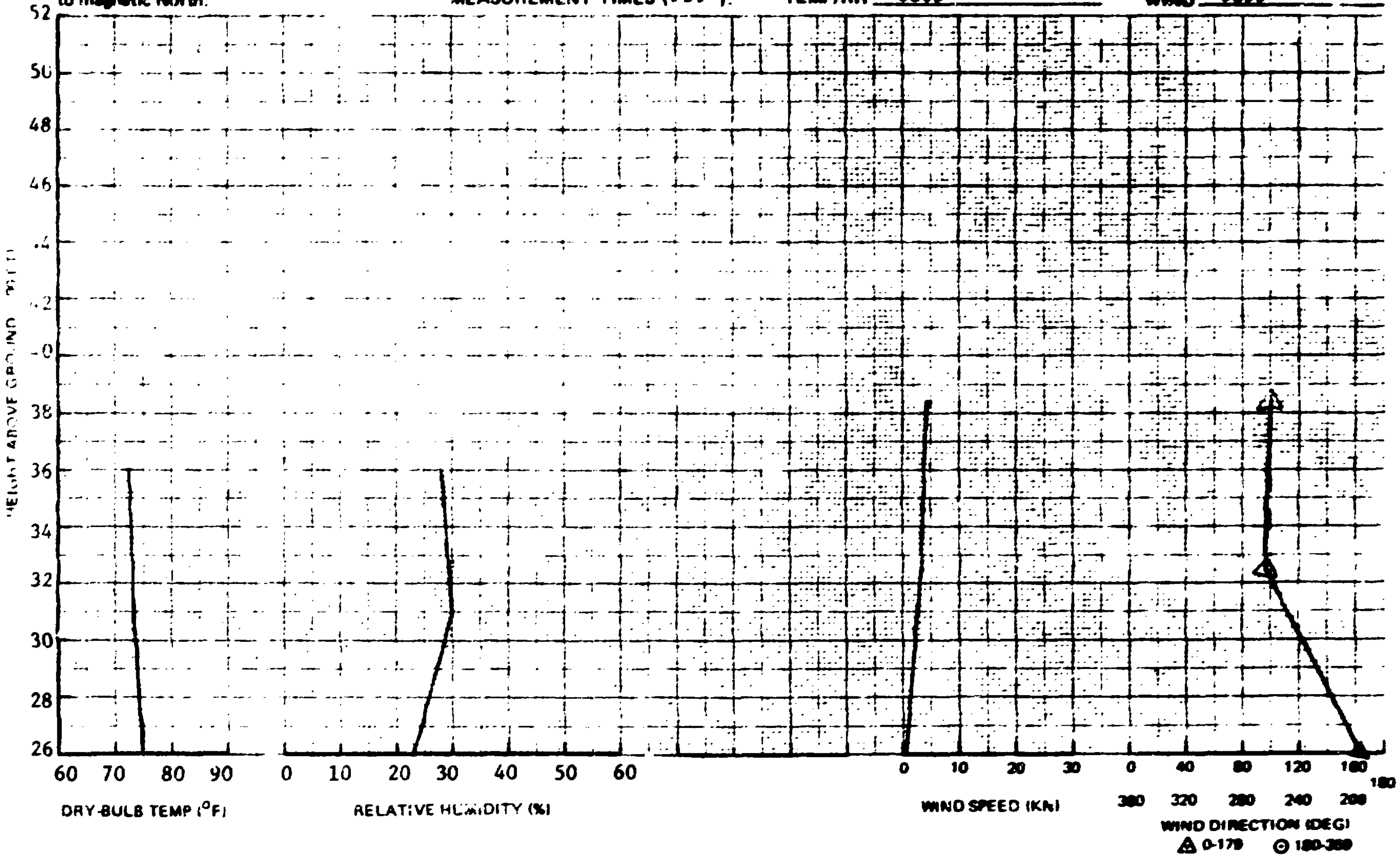


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES Atm abs coeff is 1 [illegible] value [illegible] SAE ARP 866 1970 Rev

Wind direction is heading from which wind is blowing referenced to magnetic North

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST) TEMP/RH 0315 WIND 0420

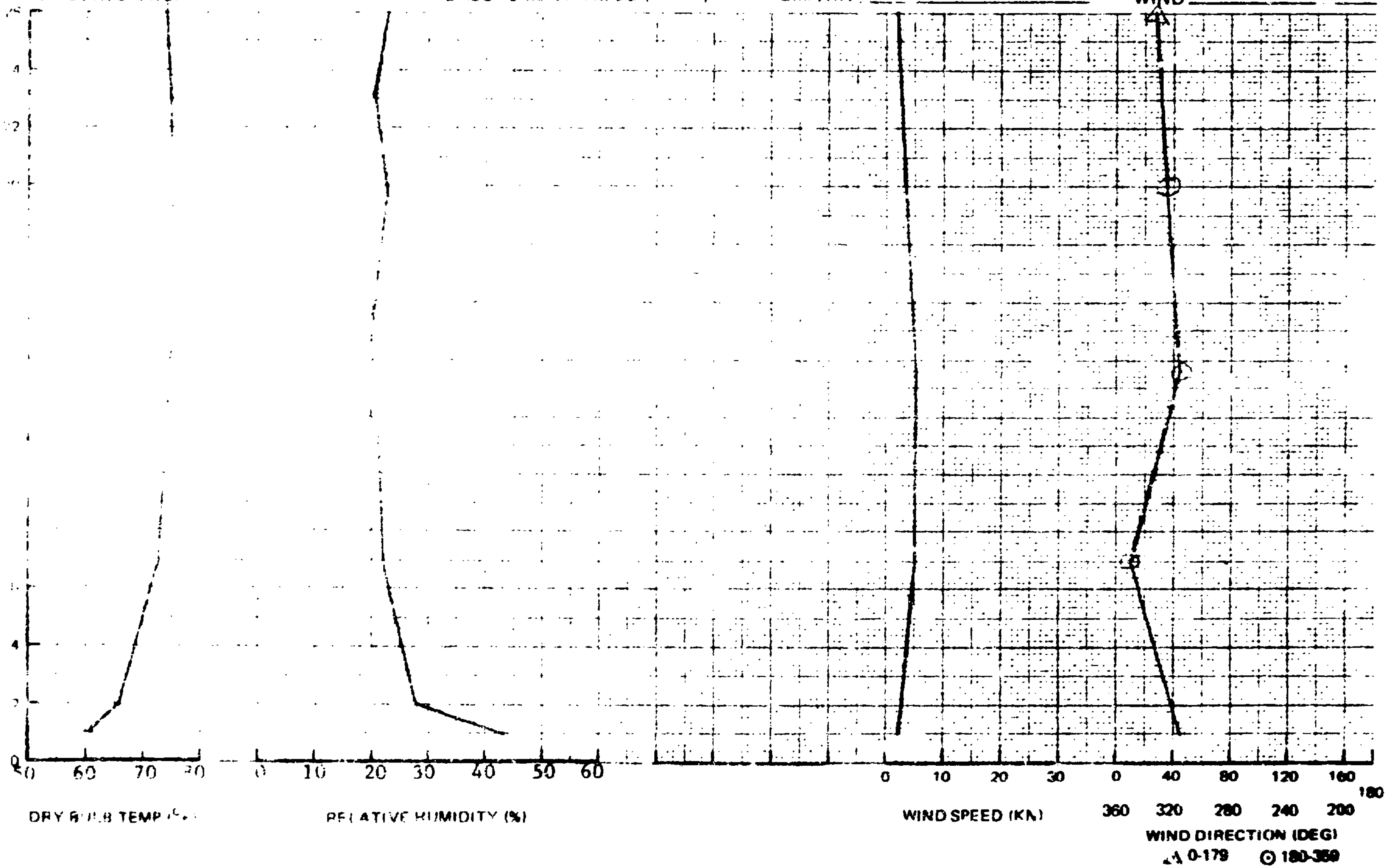


FIGURE B-4 UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTES: Atm abs coeff is 1.3 O B. value of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0315 WIND 0420

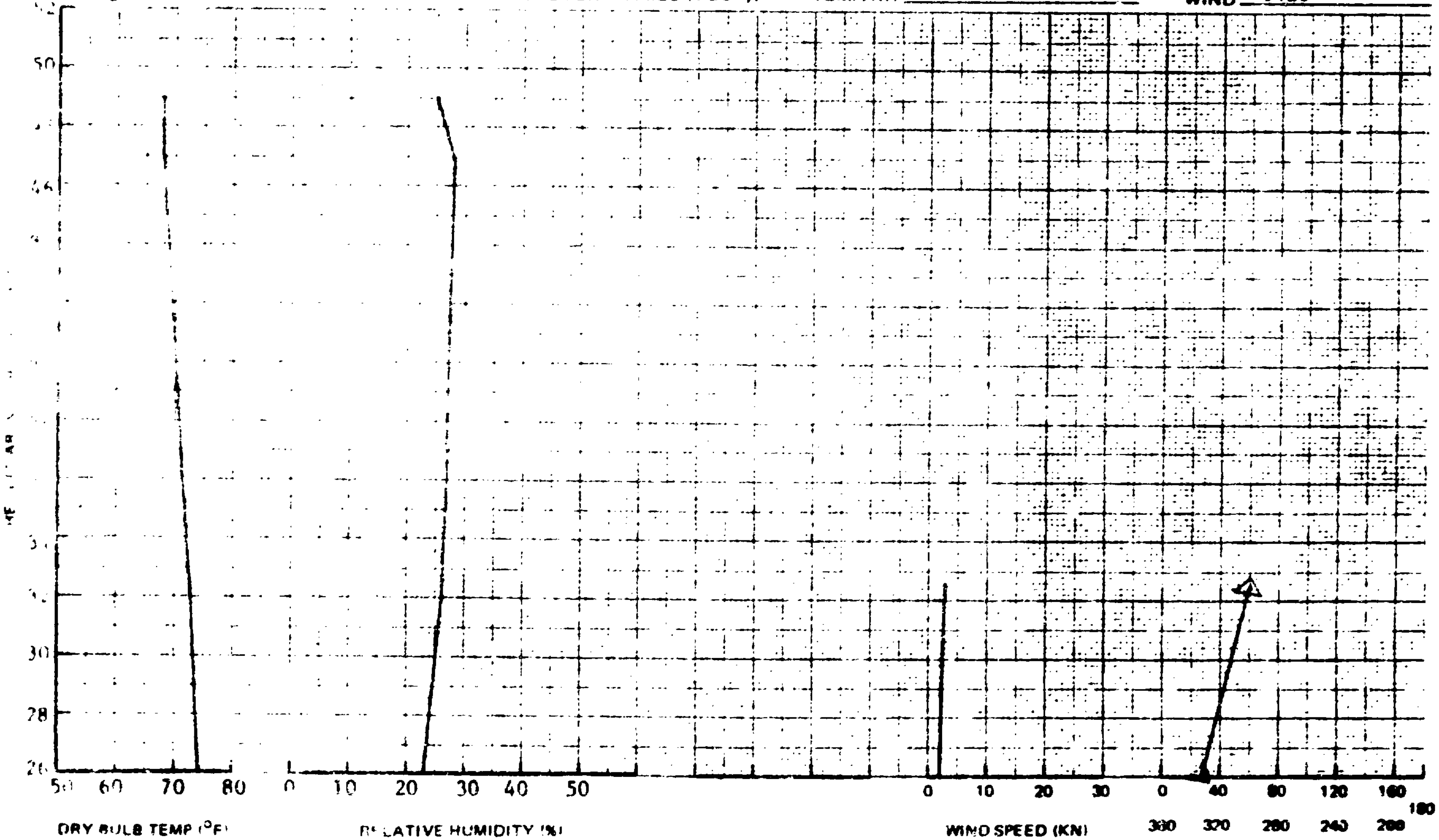


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTE: ... ARP 866 1970 ...

W... is heading from which wind is blowing referenced ... magnetic North.

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0315 WIND 0420

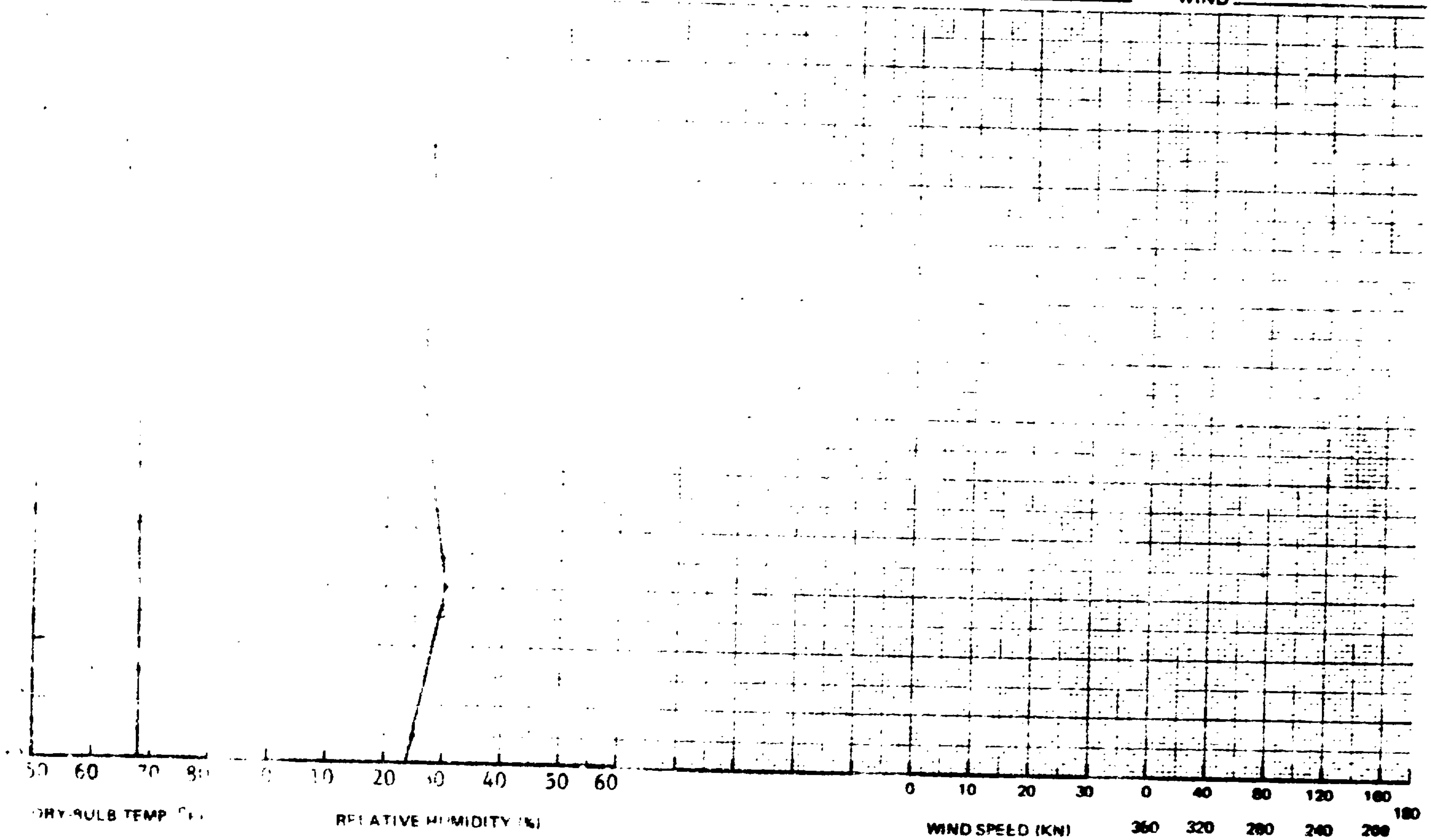


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES: Atm abs coeff is 1/3 O.B. value of SAE ARP 866 1970 Rev

Wind direction is heading from which wind is blowing referenced to magnetic North.

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0315 WIND 0420

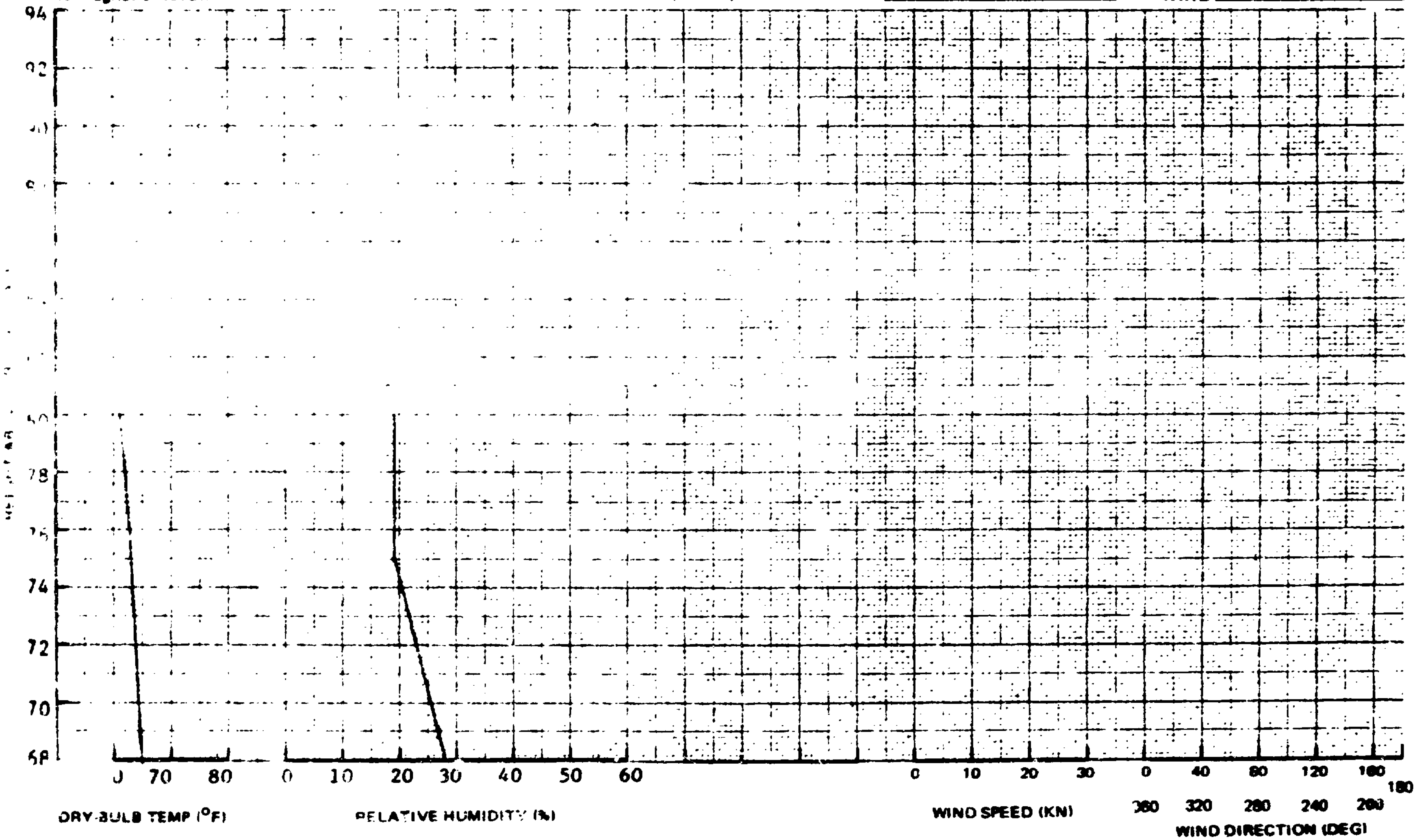


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

NOTES: Atm. abs. coeff. is 1/3 O.B. vals. of SAE ARP 866 1970 Rev.

Wind direction is heading from which wind is blowing referenced to magnetic North.

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0435 WIND

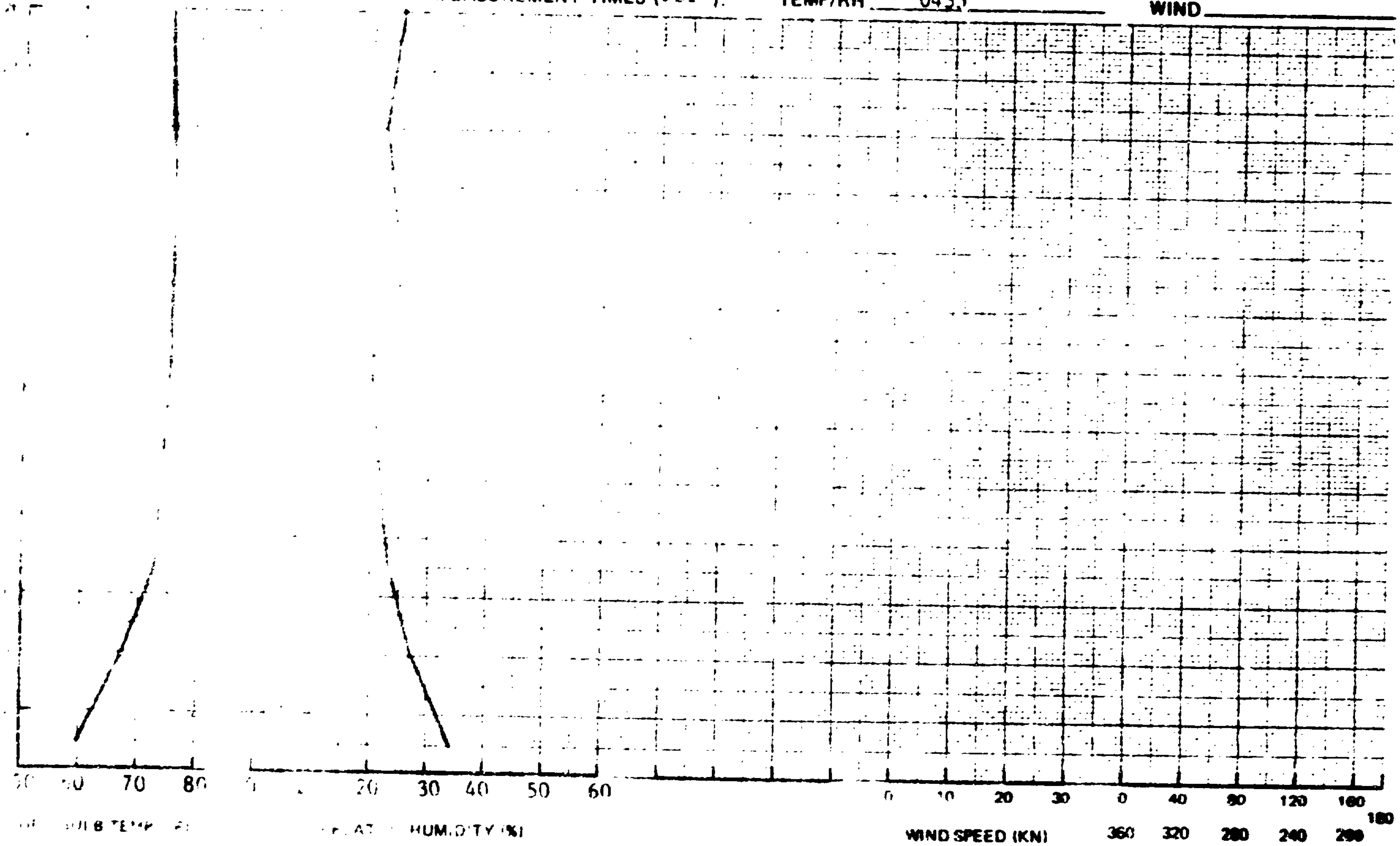


FIGURE B-4 UPPER AIR SOUND PATH WEATHER DATA (CONTINUED)

SOUND-PATH WEATHER DURING FLYOVER NOISE TESTS

NOTES Atm abs coeff is 1.3.0 s value of SAE ARP 866 1970 Rev

Wind direction is heading from which wind is blowing referenced to magnetic North

AIRPLANE MODEL DC-8-61 REG. NO. N8087U TEST SITE YUMA, ARIZONA

DATA SOURCE NATIONAL WEATHER CORP. DATE 8 NOV. 1973

MEASUREMENT TIMES (PST): TEMP/RH 0435 WIND

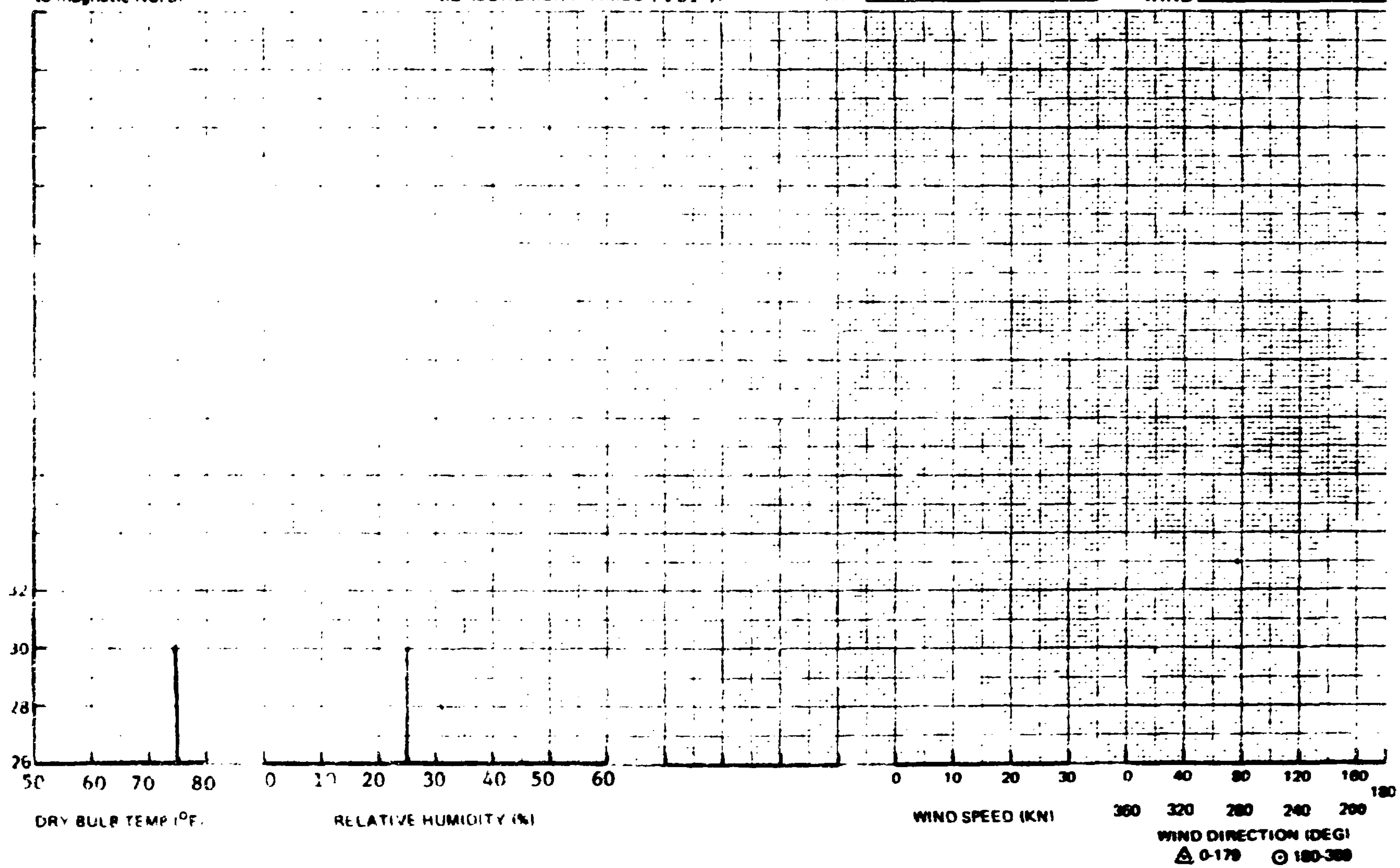


FIGURE B-4. UPPER AIR SOUND PATH WEATHER DATA (CONCLUDED)

APPENDIX C

SUMMARIES OF ACOUSTIC & AIRCRAFT OPERATION DATA

The printed output data from the computer program analyses of the measured acoustic and aircraft operation parameters are summarized and presented in Tables C-1 and C-2.

Table C-1 is a summary of the measured aircraft operation parameters used in analyzing the flyover-noise data.

Table C-2 presents selected representative computer program flyover-noise analyses of the Phase II flight test. These outputs from the E2QH computer program provide listings of the aircraft, weather, and test site parameters used in each analysis. Also shown are the following:

1. 1/3-octave band SPL's at 0.5-second intervals
2. 1/3-octave band center frequency of tone correction adjustment
3. Time history of overall SPL's at 0.5-second intervals
4. Time history of A-weighted sound levels at 0.5-second intervals
5. Time history of PNL values at 0.5-second intervals
6. Time history of PNLT values at 0.5-second intervals
7. Time history of acoustic range for noise levels at 0.5-second intervals (sound path distance)
8. Time history of optical range for noise levels at 0.5-second intervals (slant range of aircraft at time flyover-noise reached microphone)
9. Plot of time history of PNLT
10. Noise levels at time of PNLTM.

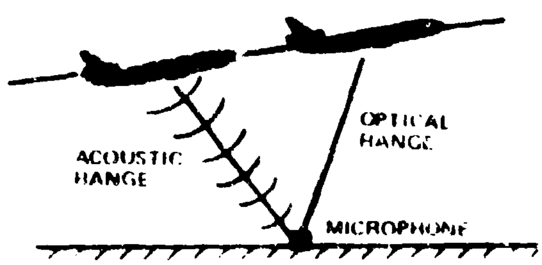


TABLE C-1

AIRPLANE PERFORMANCE SUMMARY

MODEL DC-8-61 FUSELAGE NO. 373 REGISTRATION NO. [illegible] TEST DATE11-06-73 10570410

FLIGHT NUMBER	2	2	2	2	2	2	2	2	2
RUN NUMBER	11	12	13	15	16	17	18	19	20
MICROPHONE LOCATION	B	B	B	B	B	B	B	B	B
MICROPHONE NUMBER	3	3	3	3	3	3	3	3	3
GROSS WEIGHT (1000 LBS)	276	273	271	260	259	255	254	250	247
FLAP ANGLE (DEG)	25.0	17.0	17.0	17.0	45.0	35.0	35.0	50.0	50.0
CALCULATED EPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AIRCRAFT PATH SPEED (KNOTS)	166.2	173.9	175.0	173.9	170.5	175.3	178.0	186.7	194.4
AIRPLANE HEIGHT (FEET)	1138.	819.	677.	904.	1369.	1432.	1317.	1145.	1195.
AVE MEAS REFERRED N1 (RPM)	[illegible]	5748.	5717.	5752.	3368.	3325.	3294.	4682.	4557.
(1) AVE. EXIT PRESSURE (PSIA)	26.133	22.051	21.827	21.552	15.354	15.333	15.290	17.804	17.715
(2) AVE. INLET PRESSURE (PSIA)	7.300	7.615	7.555	7.544	7.329	7.409	7.413	7.534	7.498
(3) AVE. EXHAUST TEMP (DEG F)	[illegible]	438.0	433.5	[illegible]	322.5	317.9	317.3	361.3	361.8
PITCH ATTITUDE (DEG)	11.84	8.21	8.91	6.31	-3.84	-3.99	-3.33	-5.56	-4.42
ROLL ATTITUDE (DEG)	-0.14	-0.07	-2.03	-6.11	0.79	-0.36	1.98	0.95	1.35
INBOARD FLAP POS.(RH) (DEG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INBOARD FLAP POS.(LH) (DEG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AIR TEMP. (DEG C)	27.07	28.11	28.11	28.11	27.07	27.07	27.38	28.21	28.11
PRESSURE ALTITUDE (FEET)	1342.0	955.0	1014.0	1053.0	1389.0	1445.0	1365.0	1213.0	1224.0
MEAS AIRSPEED (PILOTS) (KN)	160.8	159.5	170.6	173.3	161.5	167.3	159.3	177.3	174.5
MEASURED MACH NUMBER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CENTER OF GRAVITY (% MAC)	27.1	27.0	27.0	26.8	26.5	26.5	26.4	26.4	26.3
AVE. ENGINE FAN SPEED (RPM)	107.8	95.0	94.5	95.1	55.5	54.8	54.4	77.4	77.0

FLIGHT NUMBER	2	2	2	2	2	2	2	2	2
RUN NUMBER	21	22	23	24	25	26	27	28	30
MICROPHONE LOCATION	B	B	B	B	B	B	B	B	B
MICROPHONE NUMBER	3	3	3	3	3	3	3	3	3
GROSS WEIGHT (1000 LBS)	245	242	240	236	236	231	228	225	217
FLAP ANGLE (DEG)	50.0	50.0	50.0	25.0	26.0	17.0	10.0	45.0	49.0
CALCULATED EPR	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AIRCRAFT PATH SPEED (KNOTS)	181.5	174.7	168.5	170.8	166.9	153.9	155.2	221.6	183.6
AIRPLANE HEIGHT (FEET)	1201.	452.	544.	2194.	2103.	2459.	2520.	5409.	5219.
AVE MEAS REFERRED N1 (RPM)	4726.	6488.	6499.	6529.	6510.	4693.	4607.	6479.	5732.
(1) AVE. EXIT PRESSURE (PSIA)	17.849	26.748	26.501	25.375	25.218	16.884	16.613	23.107	18.838
(2) AVE. INLET PRESSURE (PSIA)	7.477	7.533	7.576	7.156	7.114	7.082	7.035	6.609	6.470
(3) AVE. EXHAUST TEMP (DEG F)	363.3	487.3	489.8	521.0	519.5	358.0	352.0	505.3	423.5
PITCH ATTITUDE (DEG)	-5.29	10.07	11.32	11.40	11.69	7.98	8.43	-3.33	-1.52
ROLL ATTITUDE (DEG)	-1.16	-2.54	-6.19	1.51	-0.29	-4.42	-2.90	0.48	-1.38
INBOARD FLAP POS.(RH) (DEG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INBOARD FLAP POS.(LH) (DEG)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AIR TEMP. (DEG C)	27.79	27.59	27.33	25.30	25.30	24.46	24.36	22.59	20.82
PRESSURE ALTITUDE (FEET)	1282.0	628.0	852.0	2514.0	2402.0	2536.0	2591.0	5305.0	5135.0
MEAS AIRSPEED (PILOTS) (KN)	172.3	165.3	150.5	157.3	155.8	146.3	147.0	192.3	164.3
MEASURED MACH NUMBER	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CENTER OF GRAVITY (% MAC)	26.2	25.1	26.0	25.9	25.9	25.7	25.5	25.2	24.2
AVE. ENGINE FAN SPEED (RPM)	77.1	107.1	107.3	107.4	107.1	77.2	76.7	106.0	93.6

TABLE C-1

AIRPLANE PERFORMANCE SUMMARY (CONCLUDED)

MODEL DC-9-41 FUSELAGE NO. 373 REGISTRATION NO. N8087U TEST DATE11-08-73 11230410

FLIGHT NUMBER	2	2	2	2	2	2
RUN NUMBER	31	32	33	34	37	38
MICROPHONE LOCATION	[illegible]	B	B	B	B	B
MICROPHONE NUMBER	3	3	3	3	3	3
GROSS WEIGHT (1000 LBS)	214	211	208	205	198	196
FLAP ANGLE (DEG)	45.0	45.0	25.0	26.0	12.0	5.0
CALCULATED EPR	0.0	0.0	0.0	0.0	0.0	0.0
AIRCRAFT PATH SPEED (KNOTS)	181.6	161.9	180.5	176.6	159.5	158.3
AIRPLANE HEIGHT (FEET)	840[illegible].	[illegible]295.	6166.	5207.	[illegible]73.	345.
AVE MEAS REFERRED N1 (RPM)	5742.	5713.	4794.	4781.	4075.	3597.
AVE. EXIT PRESSURE (PSIA)	[illegible]	16.729	15.606	15.582	16.726	16.572
AVE. INLET PRESSURE (PSIA)	5.333	5.737	6.481	6.445	7.523	7.374
AVE. EXHAUST TEMP (DEG F)	412.5	[illegible]	352.0	351.5	332.0	322.0
PITCH ATTITUDE (DEG)	-0.44	-0.42	2.46	2.02	4.10	7.16
ROLL ATTITUDE (DEG)	-0.22	0.16	0.32	0.0	-0.94	-0.73
INBOARD FLAP POS.(RH) (DEG)	0.0	0.0	0.0	0.0	0.0	0.0
INBOARD FLAP POS.(LH) (DEG)	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL AIR TEMP. (DEG C)	15.[illegible]	15.52	20.09	19.38	25.71	25.3[illegible]
PRESSURE ALTITUDE (FEET)	6154.0	6158.0	5175.0	5137.0	535.0	505.0
MEAS AIRSPEED (PILOTS) (KN)	158.5	156.8	159.0	155.5	150.0	[illegible]
MEASURED MACH NUMBER	0.0	0.0	0.0	0.0	0.0	0.0
CENTER OF GRAVITY (MAC)	23.9	23.6	23.3	23.0	22.3	22.0
AVE. ENGINE FAN SPEED (RPM)	92.9	92.4	77.9	77.9	67.1	64.0

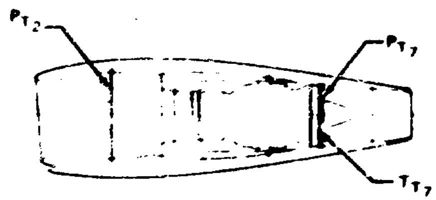
P_{T_7}

P_{T_2}

T_{T_7}

ENGINE PRESSURE RATIO

$$EPR = \frac{P_{T_7}}{P_{T_2}}$$



NOTE: FLIGHT NUMBER 1 - NOVEMBER 6-7, 1973
FLIGHT NUMBER 2 - NOVEMBER 7-8, 1973

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES

FAR PART 36 FLYOVER NOISE LEVELS

DATA IDENTIFICATION INFORMATION

DATA DIGITIZED 12-17-73 DATA PROCESSED 04/08/75 1110C408 PAGE 1

MODEL DC-8-61 REG. NO. N8087U

DC-8-61 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS

ENGINE/NACELLE CONFIGURATION -- P&WA JT3D-3B ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- TAKE-OFF OR FLYOVER DATA CLASS -- POWER
MEASUREMENT TYPE -- BENEATH FLT PATH, 4 FT ABOVE SANDY DIRT
RECORDING AT X = 12082.0, Y = 221.0, Z = 2.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE RECORDING LOCATION X = 12082.0, Y = .0, Z = .0 FEET

MEASUREMENT INFO				AIRPLANE AND ENGINE DATA		WEATHER DATA	
MIC. NUMBER	1	FLT. NO.	373	AVG. N1	6513. RPM	AMB. TEMP.	58.0 F
MIC. LOCATION	A	FLT	2	AVG. EPR	N/A	REL. HUM.	56.9 PCT
MIC. [illegible]	[illegible]	RUN	11	A/P HEADING	210. DEG	ABS. HUM.	6.3 GM/M3
[illegible]	[illegible]	[illegible]	492.6 FT	FLAP POS.	25.0 DEG	WIND SPEED	2. KN
TEST [illegible]	11-07-[illegible]	[illegible] ELEV.	32.7 FT	PATH ANG.	7.2 DEG	WIND DIR.	55. DEG
[illegible]	13.[illegible]	SLNT. RNG.	493.7 FT	PITCH ANG.	11.4 DEG	STA. PRESS	29.80 IN HG
[illegible]	[illegible]	[illegible]	168.8 KN	GR. WEIGHT	276100. LB	RT. THETA	1.0220

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 23-35-41.3
OTHER PERFORMANCE DATA IS FOR TIME OF PNLTM OF 23-35-43.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 23-35-41.1

REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION GR1921(CISA) / 0.25 DB
DATA ANALYSIS 2 PASS WITH AUTO-START
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS

ATMOSPHERIC ATTENUATION SAE ARP866(REV)
BASIC UNIT SOUND PRESSURE LEVEL
(DB REL. 0.0002 MICROBAR)
DATA TYPES 1/3 OCTAVE, OVERALL, A-WTD, PNL, PNLT & EPNL

RUN 11A

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1) (10)

MEASURED SPL HISTORY / MODEL CC-8-61 FLT 2 MIC 1 TEST DATE 11-07-73 11100408
START TIME 23 35 39.000 / REG. N8087U RUN 11 LOC A PAGE 2

1/3 O.B. CTR FREQ	AMB SPL	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
50	57.9	83.1	84.6	87.1	86.5	87.6	85.1	85.2	84.1	87.5	90.6	93.5	95.7	97.1
63	60.4	83.5	84.2	85.8	85.2	86.3	84.9	84.3	79.7	83.2	86.7	94.4	96.0	97.4
80	62.9	83.9	84.6	86.9	87.7	87.1	84.9	85.3	88.2	90.4	92.1	92.4	92.9	93.5
100	61.9	84.6	84.7	84.9	83.9	85.0	89.3	93.0	96.8	99.8	101.4	102.3	101.5	99.9
125	60.0	83.2	82.4	80.2	81.8	88.6	93.8	97.7	100.6	103.1	106.4	107.6	108.0*	106.3
160	62.9	78.5	78.0	83.0	87.5	92.6	96.7	95.6	100.9	101.9	104.4	106.0	107.1	107.6
200	56.3	79.1	82.5	87.4	91.1	94.4	95.7	96.1	95.5	95.8	98.5	100.9	103.2	104.1
250	56.3	89.7	83.5	91.6	93.1	93.0	93.6	98.1	103.5	102.5	102.8	101.9	99.8	97.4
315	56.1	87.0	89.3	91.0	90.7	91.1	94.6	96.5	98.2	99.6	101.5	102.4	101.8	95.9
400	54.0	86.4	86.2	86.0	87.9	91.4	92.8	96.6	99.6	101.9	102.0	101.2	95.4	98.6
(2) 500	53.2	82.3	83.7	87.8	88.9	90.9	92.4	95.6	98.3	99.9	100.6	100.1	98.8	96.5
630	56.4	81.9	85.3	86.4	87.4	88.8	92.0	94.1	96.2	98.3	95.2	99.0	97.3	95.1
800	54.[illegible]	82.9	84.[illegible]	86.4	88.1	89.8	91.7	93.9	95.6	97.1	97.6	97.1	95.6	93.1
1000	51.2	82.0	83.8	85.4	87.1	89.3	91.3	93.8	95.2	96.3	96.3	95.5	93.5	90.5
1250	49.7	81.3	83.0	84.6	87.0	89.0	91.0	93.4	94.8	95.7	95.2	94.0	91.[illegible]	88.8
1600	48.3	78.8	81.4	82.4	85.7	87.6	89.7	91.8	93.4	93.9	93.4	91.7	89.[illegible]	85.9
2000	47.0	78.3	81.5	84.4	86.2	87.9	89.0	90.4	91.6	92.1	91.3	89.2	85.7	82.6
2500	45.9	78.6*	81.4	83.0	84.6	85.9	87.5	86.5	89.9	90.1	89.1	86.7	83.0	79.2
3150	42.4	76.4	72.6	75.1	78.3	82.1	85.8	85.6	92.5	93.4	92.5*	89.3*	83.9	75.6*
4000	40.5	62.4	65.5	70.3	75.2	81.2	87.7*	91.5*	92.4*	91.6*	88.2	84.2	79.1	73.7
5000	38.[illegible]	55.3	60.1*	66.5*	71.8*	75.5	79.1	81.2	82.1	81.7	75.7	76.2	71.0	64.7
6300	35.7	39.8	44.4	50.7	57.0	63.1	69.2	73.7	75.8	75.9	73.9	69.6	62.3	54.6
8000	33.1			38.7	46.0	55.5	64.5	65.5	70.7	70.2	66.5	60.9	53.2	44.5
10000	33.2					43.9	51.5	56.6	58.5	58.2	55.5	49.6	40.4	
[illegible]	70.4	88.6	87.2	95.4	100.7	102.6	104.8	107.6	109.5	111.2	112.7	113.3	113.3	112.6
[illegible]	91.7	91.1	93.1	95.1	98.8	98.8	100.9	103.5	105.3	106.5	106.7	106.1	104.7	103.0
[illegible] PNL	75.2	102.4	104.8	107.0	108.8	110.9	113.5	116.5	118.0	119.0	115.0	118.0	117.1	116.0
[illegible] PNLT	74.0	104.1	106.0	108.3	113.1	110.9	115.3	116.5	119.1	120.2	120.2	115.3	117.7	117.0
[illegible]		1284	1083	922	773	646	551	499	493	525	563	658	744	837
[illegible]		564	843	731	631	552	502	451	522	586	675	780	896	1018

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURE SPL HISTORY   MODEL [illegible]   FLT 2   MIC 1   TEST DATE 11-07-73   11103408

START TIME 23 35 39.000   REG. [illegible]   RUN 11   LOC 4   PAGE 3

1/3 OB (HZ)	6.5	7.0	7.5	8.0	8.5	9.0
50	97.2	97.6	97.3	97.2	95.4	93.3
63	97.3	97.6	97.0	96.2	95.0	94.0
80	94.1	93.6	91.8	91.5	91.4	91.4
100	95.9	94.0	87.3	86.7	86.7	84.0
125	104.1	99.7	95.7	92.3	89.5	83.5
160	107.1*	105.6*	102.6	95.3	96.5	93.6
200	104.7	104.6	100.6	101.9	98.7	95.5
250	99.1	100.1	100.4	95.4	97.8	95.7
315	96.6	94.4	92.0	91.1	90.5	90.0
(2) — 400	97.6	96.3	94.8*	92.4	89.7	86.3
500	93.5	92.6	89.5	95.2	88.6	87.3*
630	93.1	90.5	88.3	85.4	82.5	80.3
800	90.5	87.6	83.5	81.4	80.4	79.0
1000	87.3	85.3	82.1	79.3	77.0	74.9
1250	84.4	82.2	77.0	76.5	73.6	71.1
1600	81.[illegible]	78.7	75.2	71.7	69.1	66.7
2000	78.[illegible]	75.[illegible]	71.3	69.2	65.6	63.1
2500	75.4	71.5	67.9	64.6	61.2	58.2
3150	74.[illegible]	70.3	66.7	63.[illegible]	59.5	56.5
4000	68.6	64.0	59.7	55.2	50.8	45.6
5000	59.[illegible]	53.6	47.1			
6300	47.7	42.3				
8000						
10000						
(3) — OVERALL	111.8	110.5	108.9	107.0	104.9	102.7
(4) — A-WTD	101.5	100.1	98.5	96.7	94.7	92.4
(5) — PNL	114.5	113.1	111.3	109.4	107.0	104.8
(6) — PNLT	115.1	113.8	111.[illegible]	109.4	107.[illegible]	106.1
(7) — [illegible]	935	1036	1139	1244	1351	1459
(8) — [illegible]	1145	1275	1408	1542	1678	1814

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

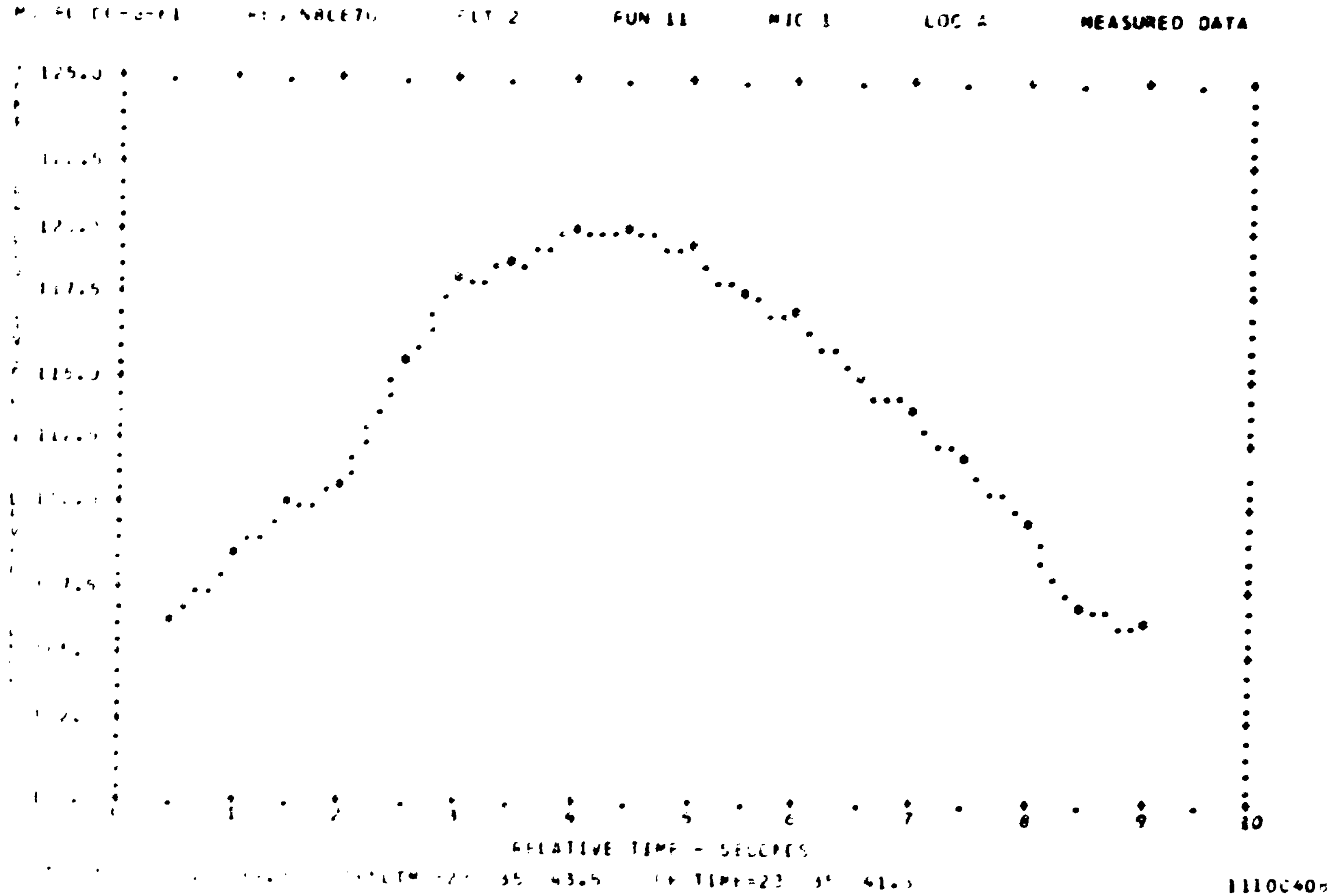


TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FAR PART 36 FLYOVER NOISE LEVELS

DATA IDENTIFICATION INFORMATION

DATA DIGITIZED 12-17-73 DATA PROCESSED 04/08/75 11100408 PAGE 1

MODEL DC-8-61 REG. NO. N8067U

DC-8-61 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS

ENGINE/NACELLE CONFIGURATION -- P&WA JT3D-3B ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- TAKEOFF CCRR FLYOVER DATA CLASS -- FN/DLT = 10000 LBS
MEASUREMENT TYPE -- PENPATH FLT PATH, 4 FEET ABOVE SANDY DIRT
RECORDING AT X = 12082.0, Y = 221.0, Z = 2.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE RECORDING LOCATION X = 12082.0, Y = .0, Z = .0 FEET

MEASUREMENT INFO		AIRPLANE AND ENGINE DATA			WEATHER DATA	
MIC. NUMBER	2	FUSE. NO. 373	AVG. N1KT =	5750. RPM	AMB. TEMP. =	57.0 F
MIC. LOCATION	A	FLIGHT 2	AVG. EPR =	N/A	REL. HUM. =	45.4 PCT
MIC. ORIENT	GRAZING	RUN 12	A/P HEADING =	210. DEG	ABS. HUM. =	5.4 GM/M3
TEST SITE	YUMA	HEIGHT = 443.3 FT	FLAP POS. =	17.0 DEG	WIND SPEED =	2. KN
TEST DATE	1 07-73	LAT. DEV. = 122.9 FT	PATH ANG. =	4.5 DEG	WIND DIR. =	100. DEG
TEST NUMBER	10.4.1	SLNT.RNG. = 460.1 FT	PITCH ANG. =	10.0 DEG	STA. PRESS =	29.80 IN HG
J. B. REEL	A4717	PATH SPD. = 174.5 KN	GR. WEIGHT =	273300. LB	RT. THETA =	1.0226

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 23-46-41.3
OTHER PERFORMANCE DATA IS FOR TIME OF PNLTM OF 23-46-42.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 23-46-41.1

REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION GR1921(CISA) / 0.25 DB
CISA MODE 1 PASS WITH AUTO-START
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS

ATMOSPHERIC ATTENUATION SAE ARP866(REV)
BASIC UNIT SOUND PRESSURE LEVEL
(DB REL. 0.0002 MICROBAR)
DATA TYPES 1/3 OCTAVE, OVERALL, A-WTD, PNL, PNLT & EPNL

RUN 12A

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY   MODEL DC-8-61   FLT 2   MIC 2   TEST DATE 11-07-73   11100408
START TIME 23 46 39.500   REG. N9C8TU   RUN 12   LOC A   (1)(10)   PAGE 2

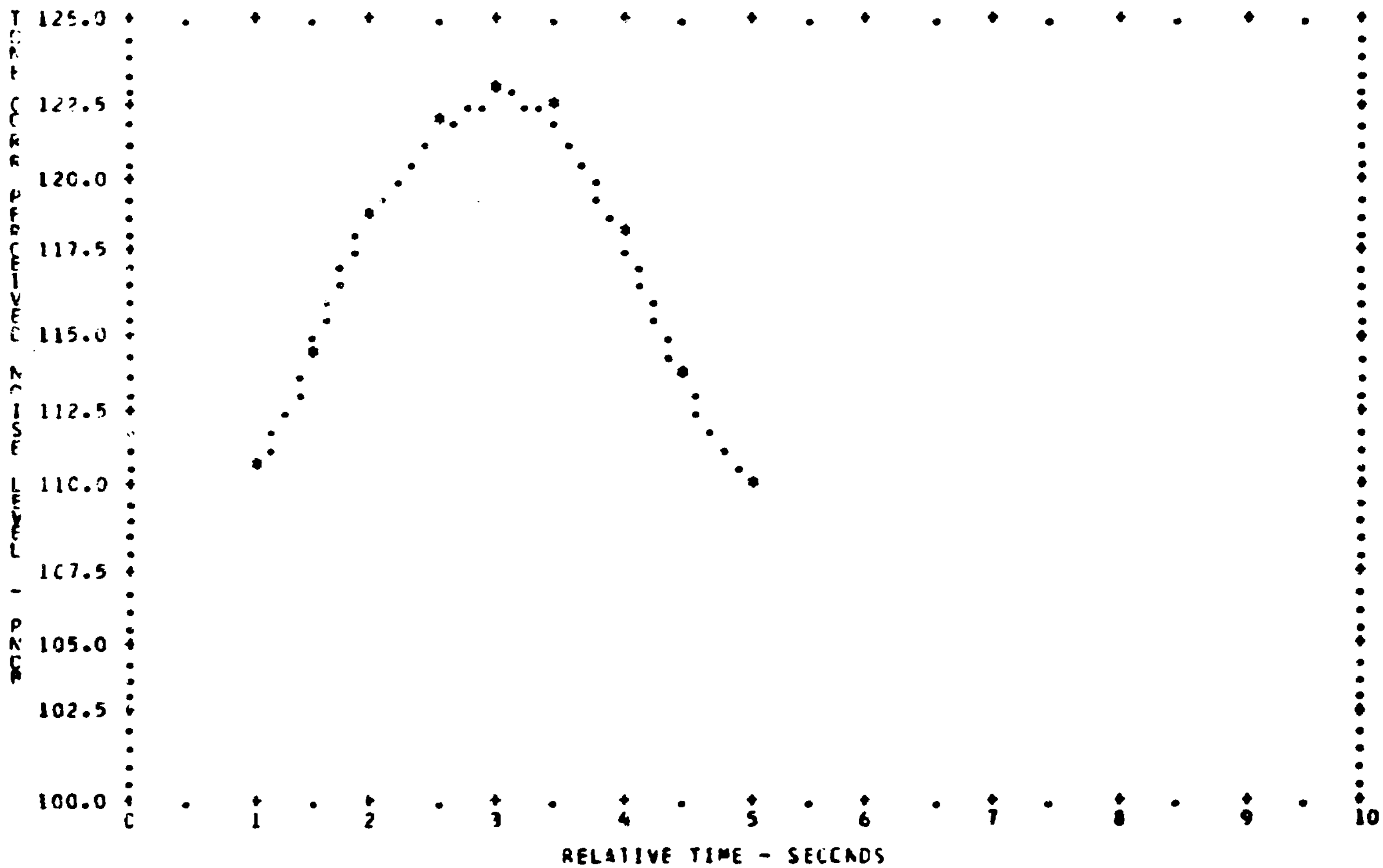
1/3 O.B. GMF(HZ)	AMB SPL	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
50	63.3	79.1	80.1	82.0	82.2	82.5	81.7	84.3	85.9	87.5	89.4	90.0	90.1
63	62.2	81.9	82.2	82.0	81.2	80.0	79.2	79.3	84.1	87.0	88.8	89.4	90.7
80	65.9	80.7	81.2	80.8	79.8	79.5	80.7	83.7	84.1	84.1	84.7	89.3	89.9
100	64.0	81.2	80.8	79.5	79.5	84.5	88.6	91.7	93.4	94.0	94.7	90.1	84.6
(2)—— 125	64.3	76.8	75.7	80.3	88.0	91.2	93.7	96.4	98.4	99.5	98.9	97.0	92.9
160	65.1	74.2	79.9	86.6	90.9	92.9	94.5	96.3	98.8	99.4	99.6	97.9	96.5
200	60.2	80.4	86.0	85.4	90.6	90.4	89.7	89.8	91.6	94.1	95.9	95.5	93.0
250	57.4	84.4	86.6	87.6	87.1	88.3	90.7	93.4	93.9	92.9	90.3	89.0	89.1
315	55.5	84.5	85.0	84.5	86.6	90.0	92.5	94.6	95.6	95.3	93.4	89.6	85.0
400	55.9	81.7	82.7	84.9	85.9	88.6	92.1	94.4	94.5	92.9	89.6	87.8	86.5
500	56.2	79.9	83.3	84.6	86.7	89.0	92.0	93.2	93.3	92.0	89.5	86.2	82.3
630	55.5	80.8	83.0	84.3	86.6	88.6	91.6	92.9	93.2	91.7	89.2	85.3	82.4
800	55.4	81.1	82.6	85.0	86.8	88.6	90.5	91.4	91.5	90.1	87.9	84.3	80.6
1000	55.3	80.7	82.4	84.3	86.4	88.8	90.5	91.3	91.0	89.4	86.7	82.7	78.4
1250	54.4	79.9	81.7	84.7	86.9	89.0	90.0	90.6	89.5	88.4	85.2	81.6	77.8
1600	53.1	79.6	81.8	85.0	86.9	88.4	88.8	89.3	88.2	86.6	82.3	78.6	74.5
2000	51.8	83.7	86.4	87.8	87.8	87.1	87.0	87.4	87.0	84.9	81.3	76.4	72.0
2500	48.6	81.4	82.2	82.6	85.0	87.6	90.4	92.5	92.9	91.6	88.5*	83.8*	79.3*
3150	47.2	72.3	75.7	80.2	86.5	96.6*	100.0*	100.6*	98.9*	93.6*	86.7	80.9	75.3
4000	45.3	71.1	76.8*	83.9*	89.0*	91.4	91.7	90.3	87.1	83.2	77.3	71.8	65.9
5000	43.7	64.7*	68.1	71.5	74.7	78.3	81.1	82.2	81.3	78.3	72.2	64.1	58.0
6300	40.6	47.0	52.3	62.0	69.2	79.0	84.5	85.1	84.2	78.0	65.6	60.2	52.2
8000	37.9		45.8	55.8	64.5	70.4	73.2	73.5	71.6	66.2	57.1	46.2	
10000	38.6				50.6	63.2	68.6	65.1	67.9	59.4	46.5		
(3)—OVERALL	73.0	93.9	95.8	97.8	100.0	102.8	105.1	106.4	106.8	106.4	105.3	103.6	101.9
(4)——A-WTD	64.4	91.1	93.1	95.4	97.7	101.5	104.0	104.7	103.8	101.2	98.0	94.6	91.8
(5)——PNL	76.6	103.8	106.1	108.3	111.5	116.5	119.2	120.1	119.2	116.0	112.0	108.3	105.7
(6)——PNLT	76.6	104.9	107.8	111.0	114.4	118.9	121.9	123.0	122.1	118.3	113.5	110.0	107.6
(7)—200 PNG		1109	931	771	632	527	489	462	498	502	643	735	833
(8)——1PT PNG		846	726	618	531	474	460	452	563	659	772	895	1024

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MODEL CC-8-61 REG N8CE7U FLT 2 RUN 12 MIC 2 LOC A MEASURED DATA

(9)



ST TIME=23 46 35.5 TFALTM =23 46 42.5 CP TIME=23 46 41.3 11100408

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FAR PART 36 FLYOVER NOISE LEVELS

DATA IDENTIFICATION INFORMATION

DATA DIGITIZED 1-2-74 DATA PROCESSED 04/08/75 11120408 PAGE 1

MODEL DC-8-61 REG. NO. N8087U

DC-8-61 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS

ENGINE/NACELLE CONFIGURATION -- P&WA JT3D-3B ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- APPR. CORR. FLYOVER CATA CLASS -- FN/DLT = 5000 LBS
MEASUREMENT TYPE -- BENEATH FLT PATH, 4 FEET ABOVE SANDY DIRT
RECORDING AT X = -2802.0, Y = 219.0, Z = -5.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE RECORDING LOCATION X = -2802.0, Y = .0, Z = .0 FEET

MEASUREMENT INFO		AIRPLANE AND ENGINE DATA		WEATHER DATA
MIC. NUMBER 12	PULSE. NO. 373	AVG. N1RT = 4692. RPM		AMB. TEMP. = 56.2 F
MIC. LOCATION D	FLIGHT 2	AVG. EPR = N/A		REL. HUM. = 47.1 PCT
MIC. ORIENT GRAZING	RUN 19	A/P HEADING = 210. DEG		ABS. HUM. = 5.4 GM/M3
TEST SITE YUMA	HEIGHT = 426.5 FT	FLAP POS. = 50.0 DEG		WIND SPEED = 3. KN
TEST DATE 11-08-73	LAT. DEV. = -126.7 FT	PATH ANG. = -1.1 DEG		WIND DIR. = 45. DEG
TEST NUMBER 10.4.1	SLNT.RNG. = 445.0 FT	PITCH ANG. = -.7 DEG		STA. PRESS = 29.80 IN HG
JOB REEL 34737	PATH SPD. = 188.4 KN	GR. WEIGHT = 249800. LB		RT. THETA = 1.0228

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 0-58-56.8
OTHER PERFORMANCE DATA IS FOR TIME OF PNLTM OF 0-58-58.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 0-58-56.8

REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION GR1921(CISA) / 0.25 DB
CISA MODE 1 PASS WITH AUTO-START
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS

ATMOSPHERIC ATTENUATION SAE ARP866(REV)
BASIC UNIT SOUND PRESSURE LEVEL (DB REL. 0.0002 MICROBAR)
DATA TYPES 1/3 OCTAVE, OVERALL, A-WTD, PNL, PNLT & EPNL

RUN 19D

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)(10)

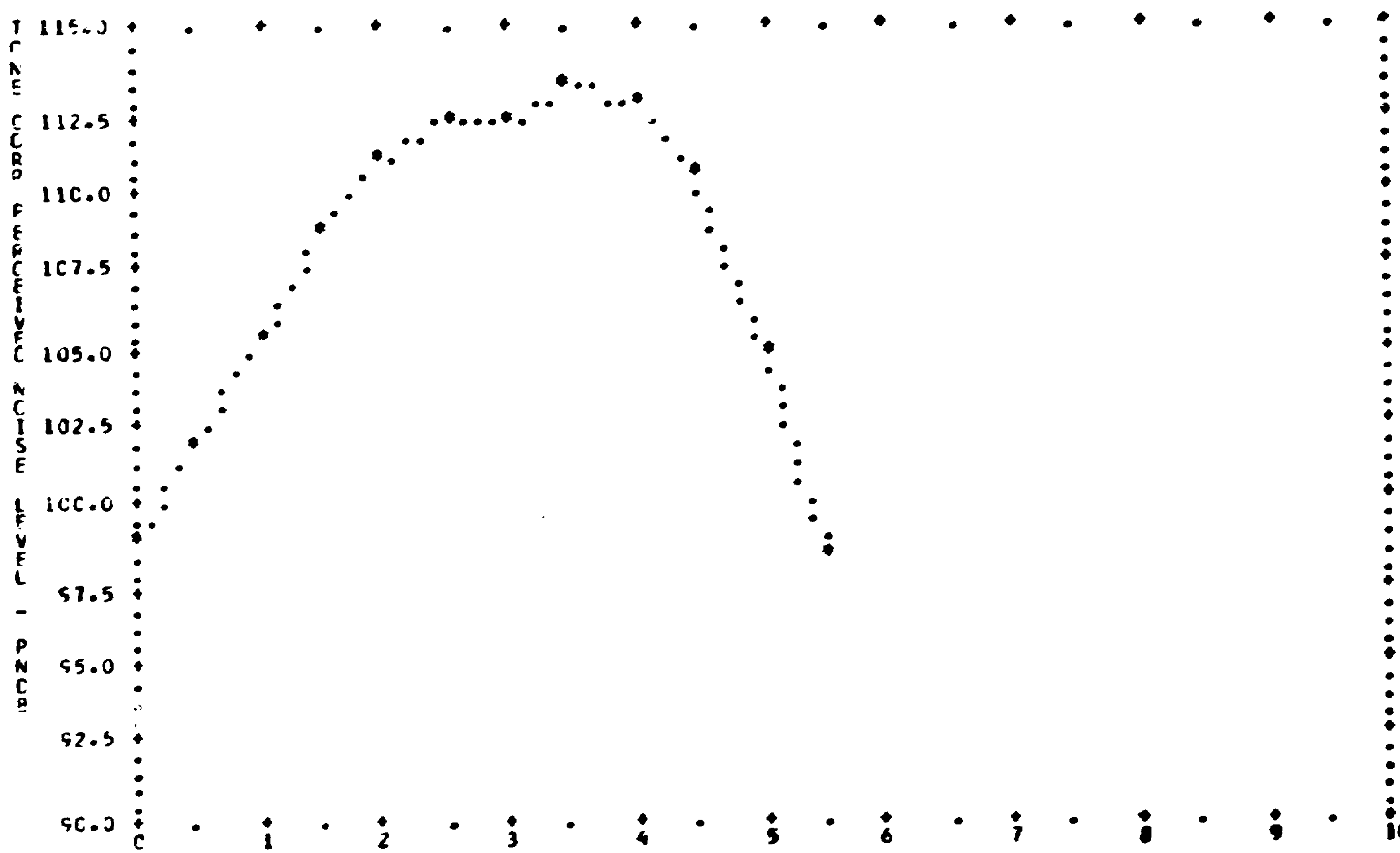
MEASURED SPL HISTORY MODEL CC-8-61 FLT 2 MIC 12 TEST DATE 11-08-73 11120408
START TIME 0 58 55.0CC REG. N8087U RUN 19 LCC D PAGE 2

1/3 O.B. CMF(FZ)	AMB SPL	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5
50	63.2	73.6	74.3	76.8	79.0	79.0	77.8	75.2	74.9	75.7	76.9	77.3	76.8
(2) 63	63.9	74.2	74.6	74.8	76.0	76.0	75.0	70.8	69.3	73.2	76.2	78.4	79.3
80	62.4	73.1	74.0	75.4	74.2	73.3	71.4	73.3	73.5	72.6	73.1	75.5	76.8
100	59.8	67.7	67.9	67.1	68.2	74.2	78.5	81.7	81.8	80.6	75.7	72.2	72.2
125	57.6	61.4	63.9	70.2	74.5	80.8	83.0	86.2	85.8	85.3	80.6	77.8	72.4
160	55.3	69.8	73.3	76.1	80.5	83.8	85.0	85.3	85.1	84.8	84.1	81.6	78.3
200	53.2	76.2	78.4	80.4	82.2	82.9	82.4	80.5	81.2	82.5	83.8	82.7	80.6
250	58.4	77.4	78.7	75.6	79.1	80.8	84.1	85.0	84.6	81.5	75.8	79.4	79.4
315	63.1	77.8	76.6	72.0	77.9	81.7	82.7	83.3	84.2	84.0	82.8	78.0	75.6
400	62.4	70.2	73.3	77.9	79.6	81.0	83.3	84.8	85.0	83.6	81.1	78.9	75.7
500	58.3	75.4	77.2	73.5	79.6	80.8	83.0	83.7	83.7	82.4	80.4	78.6	75.7
630	55.8	72.7	73.8	77.6	78.9	80.3	81.6	82.8	82.7	81.4	79.2	77.2	74.8
800	56.5	72.2	73.8	76.4	78.2	80.2	81.3	81.8	81.4	80.6	79.0	77.1	74.1
1000	53.4	70.8	73.5	76.2	78.5	80.4	81.3	81.7	81.6	81.0	79.7	77.1	74.0
1250	51.9	70.9	74.6	76.8	79.1	80.9	82.4	83.0	83.0	81.9	80.1	76.6	72.7
1600	49.3	71.6	75.0	76.7	80.8	82.0	82.5	82.6	82.2	80.7	78.3	74.1	70.3
2000	46.7	72.6	75.5	77.3	78.4	79.1	80.8	82.2	84.5	85.0	84.3	81.2	75.4
2500	41.2	66.6	69.7	72.0	75.4	79.1	88.0	91.3*	92.5*	91.8*	86.9*	81.5*	75.1*
3150	37.1	64.5	70.6	77.5	86.5*	88.7*	90.2*	88.4	86.7	83.4	75.9	76.5	64.7
4000	35.1	70.7*	74.6*	79.6*	81.9	81.8	80.9	79.8	76.8	75.9	73.0	68.3	61.8
5000	33.6	48.1	51.5	58.1	63.5	67.5	72.7	77.0	77.8	76.9	72.3	65.3	37.3
6300	30.2	36.2	41.0	48.5	58.8	64.5	69.0	70.3	69.5	66.7	61.6	54.5	45.2
8000	27.1	32.2	35.0	44.3	51.3	53.6	59.7	62.8	63.3	61.5	58.3	44.7	34.9
10000	24.8			29.5	50.8	49.9	53.1	53.3	53.5	50.7	44.5	32.2	
(3) OVERALL	71.7	86.0	87.7	90.1	92.9	94.6	96.5	97.3	97.6	96.6	94.5	91.5	88.9
(4) A-WTD	64.4	82.2	84.8	88.0	91.8	93.4	95.6	96.3	96.5	95.6	93.2	88.7	84.2
(5) PNL	75.1	94.4	97.5	101.4	106.4	108.2	110.1	110.5	111.7	110.1	107.5	102.4	97.3
(6) PNLT	75.1	99.3	101.8	105.5	109.1	111.0	112.5	112.5	113.7	112.5	110.5	104.7	98.8
(7) ACC RNG		1287	1082	887	711	566	473	445	473	530	625	723	830
(8) OPT RNG		945	806	677	564	482	445	465	535	638	762	897	1039

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MODEL DC-9-61   REG N8C87U   FLT 2   RUN 19   MIC 12   LOC D   MEASURED DATA



(9)

ST TIME= 0 58 55.0   TEALTM = 0 58 58.5   CH TIME= 0 58 56.8   11120408

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

```
                    FAR PART 36   FLYOVER NOISE LEVELS
                   DATA IDENTIFICATION INFORMATION
   DATA DIGITIZED 1-2-74          DATA PROCESSED 04/08/75          111CC408 PAGE 1

                        MODEL DC-8-61   REG. NC. N8C87U
                        DC-8-61 FLYOVER NOISE DEFINITION
              MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS
   ENGINE/NACELLE CONFIGURATION -- P&WA JT3C-35 ENGINES WITH PRODUCTION NACELLES

   TYPE OF FLYOVER -- LEVEL FLIGHT                     DATA CLASS --        POWER
   MEASUREMENT TYPE -- BENEATH FLT PATH, 4   FEET ABOVE SANDY DIRT
   RECORDING AT X =  6835.0, Y =  221.0, Z = -2.0 FEET FROM WEST-MOST END OF RUNWAY
   REFERENCE RECORDING LOCATION  X =  7034.0, Y =     .0, Z =    .0 FEET

MEASUREMENT INFO                      AIRPLANE AND ENGINE DATA                   WEATHER DATA
MIC. NUMBER   3         FLSE. NO. 373         AVG. N1AT =    6475. RPM   APR. TEMP. = 56.0 F
MIC. LOCATION 8         FLIGHT    2           AVG. EPR    = N/A          REL. HUM.  = 45.9 PCT
MIC. ORIENT  GRAZING    RUN       26          A/P HEADING =   210. DEG   ABS. HUM.  =  5.3 GM/M3
TEST SITE    YUMA       HEIGHT   = 5409.6 FT  FLAP POS.   =   45.0 DEG   WIND SPEED =   2. KN
TEST DATE   11-08-73    LAT. DEV. =  599.8 FT PATH ANG.   =     .5 DEG   WIND DIR.  =  50. DEG
TEST NUMBER 10.4.1      SLNT.RNG. = 5442.7 FT PITCH ANG.  =   -3.1 DEG   STA. PRESS = 29.75 IN HG
JOB REEL     44737      PATH SPD. =  221.8 KN GR. WEIGHT  = 224600. LB   RT. THETA  = 1.0131

      AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF   2-32-17.8
                 OTHER PERFORMANCE DATA IS FOR TIME OF PNLTM OF   2-32-20.5
      TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION   2-32-16.2

      REFERENCE SURFACE WEATHER CONDITIONS   TEMP = 77.0 F & REL. HUM. = 70.0 PCT

                      DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION  GR1921(CISA) / 0.25 DB   ATMOSPHERIC ATTENUATION  SAE ARP866(REV)
CISA MODE  1  PASS WITH AUTO-START                   BASIC UNIT    SOUND PRESSURE LEVEL
SAMPLE INTERVAL FOR BASIC DATA =  .500 SECONDS                     (DB REL. 0.0002 MICROBAR)
AVERAGING TIME = 1.500 SECONDS                       DATA TYPES    1/3 OCTAVE, OVERALL, A-WTD,
                                                                   PNL, PNLT & EPNL
```

RUN 208

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 3 TEST DATE 11-08-73 11160404
START TIME 2 31 58.000 REG. ABC87U RUN 28 LOC 8 PAGE 2

(1)

1/3 O.B. GPF(HZ)	AMB SPL	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
50	59.9					63.6	63.6	64.1	64.1	64.0	63.6	63.6	63.3	64.0
63	58.3	63.2	63.5	63.6	65.1	65.1	65.1	63.1	63.3	64.0	65.3	65.1	65.0	65.6
80	57.2	62.6	63.3	64.3	64.1	63.6	63.0	62.4	63.2	63.6	64.4	64.5	66.5	66.4
100	54.5	59.9	60.3	60.1	59.5	60.8	62.1	62.1	61.4	60.9	60.2	59.8	58.9	58.5
125	50.9									54.5	54.6	54.7	54.4	55.2
160	48.5	59.2	59.6	60.0	60.1	60.4	62.3	63.1	63.8	63.8	64.3	64.3	64.6	65.1
(2)—200	50.2	65.5*	65.5	66.2	66.7	66.4	66.8	67.2	67.6	68.0	66.5	68.5	68.7	65.2
250	51.1	65.4	66.3	67.1	67.9	67.6	66.6	69.2	65.6	69.5	69.9	70.6	71.4	71.8
315	50.6	64.7	65.0	65.6	65.2	65.3	65.7	62.4	66.2	65.6	65.8	65.8	65.8	65.0
400	45.1	55.2	55.4	55.6	56.0	55.3	55.8	56.3	57.3	58.3	59.2	60.7	61.4	62.4
500	38.6	55.5	56.2	57.6	58.3*	58.6*	59.4*	60.5*	61.2*	61.8*	61.7*	63.1*	63.3*	63.4*
630	40.1	53.4	53.3	53.8	54.4	54.3	54.0	54.2	53.8	54.0	53.7	55.2	55.5	56.4
800	38.2	45.0	46.2	47.6	49.2	49.9	50.0	50.5	50.7	52.3	52.5	53.8	54.0	54.6
1000	33.9		37.4		37.5	37.6	39.0	41.3	41.5	44.0	44.7	46.5	47.0	47.9
1250	29.9										33.3	35.1	37.3	38.9
1600	25.8													
2000	23.1													
2500	20.8													
3150	19.8													
4000	19.8													
5000	20.1													
6300	20.0													
8000	20.0													
10000	21.1													
(3)—OVERALL	64.9	72.2	72.7	73.3	73.8	74.0	74.5	74.5	75.1	75.2	75.6	76.0	76.3	76.6
(4)—A-WTD	49.9	62.5	63.3	64.0	64.5	65.3	64.9	65.7	66.0	66.0	66.3	67.0	67.4	67.7
(5)—PNL	56.6	71.6	72.1	72.9	73.5	73.4	74.2	75.2	75.5	75.8	76.0	76.6	77.3	77.8
(6)—PNLT	56.6	72.1	72.1	72.9	74.6	74.7	75.7	77.1	77.4	77.7	77.8	78.3	79.0	79.2
(7)—ACC RNG		12295	12095	11856	11657	11498	11330	11102	10965	[illegible]	10612	10318	10134	[illegible]
(8)—CPT RNG		9105	8970	8833	8696	8561	8427	8294	8163	8032	7904	7777	7653	7530

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 3 TEST DATE 11-08-73 11100408
START TIME 2 31 58.000 REG. N8087U RUN 28 LOC F PAGE 3

1/3 O.B. CNF (HZ)	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
50	63.5					63.6	64.8	65.5	65.1	64.6	64.0			
63	66.4	65.8	63.7	65.3	66.3	66.5	65.3	64.5	65.3	65.2	62.1	65.8	65.2	63.8
80	66.1	64.4	64.1	64.3	64.3	63.3	62.8	67.8	62.5	62.5	61.8	61.5	61.0	61.6
100												58.2	58.6	55.7
125	56.6	57.5	59.3	59.5	60.3	60.3	61.9	63.0	64.3	65.1	67.7	[illegible]	[illegible]	[illegible]
160	66.2	66.1	67.1	67.6	68.7	69.3	69.6	65.8	70.3	70.4	70.9	71.5	72.4	73.5
(2) 200	69.7	65.9	69.9	70.7	71.7	72.2	72.4	72.8	73.2	73.5	73.6	74.0	74.8	74.8
250	71.8	72.0	72.2	72.6	71.9	71.3	70.7	71.1	72.0	72.2	71.2	71.6	71.3	71.3
315	64.2	63.4	62.6	62.8	62.9	63.3	63.1	63.6	65.1	66.1	66.7	67.7	64.3	70.2
400	62.7	64.2	64.9	66.1	66.0	67.2	67.8*	66.7	68.5	69.2	65.5	70.7*	71.1*	72.6
500	62.7	62.5	62.2	62.1	61.8	62.3	62.3	63.3	63.5	64.4	64.6	65.6	65.8	66.4
630	57.1	57.6	58.6	60.1	60.5	61.8	62.8	63.7*	64.1*	64.1*	64.2*	64.5	64.6	66.4
800	54.7	54.3	56.4	55.1	55.3	55.7	56.3	57.5	57.8	58.8	58.5	55.7	55.5	55.5
1000	48.5	48.5	49.1	50.0	50.3	50.2	49.6	50.6	51.8	52.9	53.6	54.6	54.8	54.8
1250	40.2	39.4	39.3	40.0	40.2	40.6	40.8	41.7	42.1	43.0	43.7	44.8	45.5	45.9
1600							29.6	31.3	31.6	32.9	33.5	36.1	38.0	37.4
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	76.7	76.5	76.6	77.2	77.4	77.8	77.8	76.2	78.6	79.1	75.2	75.4	80.1	80.3
(4) A-WTD	67.7	67.9	68.1	68.7	68.7	69.1	69.3	70.0	73.5	70.9	71.1	71.6	72.1	72.2
(5) PNL	77.8	77.5	78.1	78.6	78.4	78.5	78.6	75.2	79.7	80.1	80.3	81.0	81.7	81.8
(6) PNLT	77.7	77.9	78.1	78.6	78.4	78.3	79.3	80.3	81.3	81.4	[illegible]	[illegible]	[illegible]	[illegible]
(7) -CC RNG	9741	9554	9369	9175	8992	8809	8629	8452	8277	8135	7937	7773	7613	7458
(8) CPT RNG	7410	7292	7177	7064	6953	6845	6740	6637	6537	6440	6346	6256	6165	6087

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL CC-8-61 FLT 2 MIC 3 TEST DATE 11-30-73 111234C8
START TIME 2 31 56.000 REG. N8C87U RUN 28 LOC 8 PAGE 4

1/3 O.B. CTR FREQ (HZ)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0
50	64.2	63.9	63.7		63.7	65.2	65.5	65.4	64.3					63.8
63														
80														60.6
100	61.1	[illegible]	63.3	64.1	65.1	67.0	67.5	66.6	68.4	69.6	65.4	65.3	69.2	70.0
125	68.[illegible]	68.6	70.9	71.3	72.2	72.2	72.6	72.6	72.6	74.0	74.3	74.7	74.1	75.3
160	73.6	73.5	74.0	74.2	75.3	76.1	76.4	76.8	76.2	76.4	76.2	76.4	77.2	77.4
(2) 200	75.2	74.8	75.2	75.1	75.2	75.3	74.5	74.8	75.3	75.8	74.9	73.8	72.7	72.7
250	70.7	68.6	68.6	68.7	70.6	70.7	71.1	71.7	72.4	76.3	78.2	76.2	76.6	77.1
315	71.0	71.9	73.6	74.5	75.7	76.0	76.4	76.8	75.9	77.0	77.2	77.5	77.4	77.3
400	70.3	69.4	69.4	68.5	68.6	68.6	69.2	70.1	70.6	71.4	72.1	72.5	73.2	73.8
500	67.9	68.8	69.5	69.4	70.0	70.4	70.8	70.4	69.9	69.7	65.4	70.9	70.5	[illegible]
630	64.6	64.8	65.3	66.0	66.5	66.9	67.1	67.6	67.7	68.7	66.7	65.6	69.2	68.3
800	63.8	63.6	61.3	62.8	61.7	62.3	62.5	63.4	63.7	65.3	65.7	66.2	65.7	[illegible]
1000	54.8	54.8	55.3	55.2	55.5	56.3	57.4	57.9	58.0	59.0	55.6	59.5	59.0	[illegible]
1250	46.7	47.2	49.3	45.5	50.0	50.2	50.3	50.7	50.4	51.2	52.0	52.5	53.0	52.5
1600	38.6	37.2	40.4	40.6	41.1	41.3	41.7	41.6	41.6	42.2	42.5	43.7	43.9	44.0
2000									26.7	28.0	28.4	29.2	29.7	30.[illegible]
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVL	80.6	80.4	81.1	81.2	82.1	82.4	82.7	83.0	83.0	83.6	83.7	84.0	84.0	84.4
(4) A-WTC	72.7	72.5	73.2	73.4	74.2	74.5	74.6	75.1	75.2	75.8	76.1	76.6	76.5	76.7
(5) PNL	82.0	81.8	82.2	82.7	83.7	84.2	84.5	84.9	85.0	85.4	85.6	86.0	85.9	86.1
(6) PNLT	82.0	81.6	82.2	82.7	83.7	84.2	84.5	84.9	85.0	85.4	85.6	86.0	85.9	86.1
(7) ACC RNG	7307	7162	7021	6885	6754	6627	6506	6351	6201	6178	6001	5991	5839	5813
(8) CPT RNG	6009	5936	5867	5802	5743	5688	5638	5594	5557	5526	5502	5476	5512	5525

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(10)

MEASURED SPL HISTORY 2 31 58.0CC MODEL DC-8-61 REG. N8087U | FLT 2 RUN 28 MIC 3 LOC B TEST DATE 11-08-73 PAGE 4

MEASURED SPL START TIME	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0
1/3 OCT. BAND (HZ)														
50	63.4													
63														
80	62.1	63.9	64.3	64.6	64.1	64.1	64.3	63.7	64.0	63.2	63.5	62.6	62.0	61.7
100	71.2	71.1	71.5	71.5	72.0	71.9	72.2	72.2	71.5	71.0	72.4	73.6	73.4	72.3
125	75.9	75.8	73.7	75.6	75.1	76.5	76.6	77.1	76.4	77.4	77.5	78.1	78.2	77.9
160	78.1*	77.7*	77.8*	77.1	77.3	77.0	77.2	76.5	76.3	76.6	77.4	77.1	77.6	77.5
200	72.2	72.1	71.7	72.1	71.5	71.0	70.3	70.4	70.7	70.4	70.8	[illegible]	70.5	71.5
(2) 250	77.5	77.3	77.5	77.5*	78.0*	77.5*	77.0*	76.4*	77.1*	77.3*	77.3*	77.3*	77.6*	77.6*
315	76.5	76.3	75.7	76.2	75.8	75.7	74.9	74.7	74.8	74.4	74.6	74.7	75.3	75.7
400	74.4	[illegible]	75.7	76.4	76.5	76.8	76.5	76.1	76.3	76.1	76.1	76.4	75.5	75.8
500	73.6	71.2	71.3	71.3	71.8	72.5	72.9	72.4	72.1	71.5	72.2	72.6	73.3	73.3
630	69.2	69.6	69.7	69.9	69.5	70.4	70.9	70.8	70.5	70.5	70.7	70.9	71.2	71.2
800	66.3	66.5	66.6	66.5	66.1	66.3	66.5	66.8	67.0	67.3	67.0	66.9	66.3	66.7
1000	59.0	59.6	58.7	55.7	63.2	60.9	61.8	61.5	61.7	61.7	61.5	61.5	61.2	61.1
1250	53.0	53.5	54.3	54.6	55.0	55.0	55.2	54.5	55.0	55.0	55.5	55.6	55.8	55.8
1600	44.7	45.6	45.7	45.5	45.7	46.3	46.7	47.1	47.1	46.7	45.9	45.3	46.2	46.8
2000	31.0	33.3	34.0	34.3	34.2	34.1	34.2	33.7	33.2	33.1	33.4	34.0	34.2	33.9
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	84.6	84.6	84.6	84.7	84.9	84.8	84.7	84.4	84.4	84.6	84.3	83.8	83.2	83.1
(4) A-WTD	76.8	77.3	77.1	77.3	77.5	77.6	77.5	77.2	77.3	77.2	77.3	77.5	77.6	77.6
(5) PNL	86.1	86.3	86.4	86.8	87.1	87.1	86.9	86.6	86.7	86.7	86.8	[illegible]	[illegible]	[illegible]
(6) PNLT	89.0	88.9	87.1	87.4	87.4	87.7	87.6	87.3	87.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(7) SCT BNC	5763	[illegible]	5645	5659	5559	5626	5530	5593	5532	5537	[illegible]	[illegible]	[illegible]	[illegible]
(8) CBT BNC	5478	5442	5449	5462	5481	5506	5538	5576	5620	5670	5725	5787	5854	5927

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY   MODEL DC-8-61   FLT 2   MIC 3   TEST DATE 11-30-73   11100468

START TIME 2 31 56.000   REG. ABC87U   RUN 28   LOC 8   PAGE 6

	1/3 O.B. CNF (HZ)	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5	32.0	32.5	33.0	33.5	34.0
	50														
	63											63.4	63.8	65.4	66.0
	80	62.4	62.5	63.3	63.5	65.4	65.4	65.5	64.9	64.4	63.9	62.9	61.9	62.3	61.3
	100	73.1	73.4	73.3	72.9	72.5	72.6	72.1	71.8	72.3	72.3	72.5	72.6	71.9	70.9
	125	77.4	76.7	76.7	76.7	76.4	76.4	76.1	76.0	75.5	76.7	77.3	76.7	75.7	74.7
	160	77.4	77.4	77.6	77.9*	77.4*	77.6*	77.5*	77.6*	77.7*	78.3*	76.5*	78.4	[illegible]	77.9
	200	71.5	72.6	72.6	72.7	72.4	72.3	72.2	71.7	71.3	71.6	72.5	73.9	74.9	75.2
(2)	250	77.2*	76.4	77.0*	76.9	76.5	75.7	75.6	75.3	75.1	74.1	74.1	73.8	73.2	72.1
	315	75.4	75.2	74.8	74.6	75.3	75.4	75.9	75.6	75.6	75.9	76.8	77.0*	76.5*	75.5*
	400	74.7	74.4	74.7	74.5	75.1	74.4	74.3	73.3	72.6	72.2	72.3	71.6	70.5	69.8
	500	72.5	71.5	71.6	71.3	70.5	69.9	70.0	70.1	70.1	70.3	70.7	71.2	71.3	71.0
	630	71.0	69.7	69.4	69.2	69.3	69.5	69.7	69.7	69.2	69.1	69.6	69.7	69.3	69.1
	800	65.7	65.1	65.1	64.7	65.0	65.6	66.1	66.5	66.6	66.8	67.0	67.4	66.8	66.0
	1000	61.0	60.4	60.8	60.7	60.5	60.7	60.9	60.7	60.8	60.8	61.2	61.1	61.6	61.5
	1250	55.8	55.5	56.2	56.1	56.4	55.6	55.4	55.0	54.8	54.9	54.5	54.1	53.4	53.5
	1600	47.2	46.6	46.3	45.1	45.1	45.3	45.7	45.7	45.5	45.7	46.4	44.5	44.0	43.6
	2000	33.7	33.5	33.5	33.4	33.5	33.2	33.5	32.2	31.6	30.4	30.7	30.7	30.3	29.9
	2500														
	3150														
	4000														
	5000														
	6300														
	8000														
	10000														
(3)	OVERALL	84.8	84.4	84.6	84.5	84.5	84.3	84.2	84.0	83.5	84.1	84.6	84.5	84.1	83.6
(4)	A-WTD	77.1	76.5	76.6	76.4	76.6	76.3	76.4	76.1	75.9	75.9	76.4	76.5	76.0	75.5
(5)	PNL	86.4	85.8	86.1	86.0	86.1	85.7	85.7	85.5	85.3	85.5	86.1	86.1	85.8	85.1
(6)	PNLT	87.3	85.8	86.7	86.5	86.6	86.3	86.3	86.1	86.0	86.2	86.1	86.0	[illegible]	[illegible]
(7)	ACC RNG	5464	5505	5549	5575	5616	5641	5710	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(8)	SPT RNG	6035	6089	6177	6270	6365	6471	6578	6690	6805	6925	7048	7175	7306	7440

(1)

MEASURED SPL HISTORY MODEL DC-8-61 / FLT 2 MIC 3 TEST DATE 11-08-73 13100408
START TIME 2 31 58.000 REG. N8087U / RUN 20 LOC P PAGE 7

1/3 O.B. CNF (HZ)	34.5	35.0	35.5	36.0	36.5	37.0	37.5	38.0	38.5	39.0	39.5	40.0	40.5	41.0
50	65.7	66.7	67.3	67.8	66.5	67.8	69.0	71.0	72.4	7[illegible].3	71.9	70.0	71.4	71.2
63		62.0	62.9	64.0	66.4	66.4	68.9	68.5	69.4	70.6	70.9	70.0	70.8	71.0
80	61.9	62.6	62.6	63.0	62.5	64.6	64.8	64.8	62.6	63.8	64.5	65.0	66.3	67.2
(2) 100	71.7	71.5	71.5	70.2	71.2	71.0	71.1	70.5	65.8	69.2	70.2	65.4	69.2	65.8
125	75.4	75.2	75.6	75.3	75.5	75.8	75.9	76.4	76.2	73.5	74.8	75.7	73.8	75.8
160	77.7	77.7	78.2	77.3	77.9	77.8	79.2	75.5	79.5	78.6	78.4	79.1	79.1	78.8
200	75.7	75.7	75.8	75.3	76.1	76.0	77.3	77.5	79.2	79.0*	78.8*	78.7	78.9	79.2*
250	71.6	71.2	70.2	69.6	69.6	65.5	70.2	70.5	70.5	70.5	70.4	70.8	71.3	72.1
315	75.2*	75.3*	74.9	74.9	74.5	74.8*	75.3*	75.4*	74.9*	73.6	72.3	71.0	70.1	69.8
400	69.0	68.6	67.9	68.0	68.2	68.4	69.2	69.8	70.4	70.6	71.0	71.1	71.1	71.1
500	71.0	71.6	71.3*	71.2*	71.2*	70.7	70.7	69.7	65.8	69.0	68.5	67.8	66.7	64.2
630	69.3	69.2	68.4	67.5	67.3	67.1	66.7	66.7	66.2	65.3	64.3	63.5	63.5	63.6
800	64.8	64.1	63.8	63.3	62.6	62.3	62.4	62.5	62.6	62.3	61.8	61.6	61.4	61.3
1000	61.5	61.1	60.5	59.3	58.6	58.2	56.1	58.2	58.0	57.5	56.7	56.2	55.8	55.5
1250	53.3	53.2	52.6	52.1	51.6	51.0	50.3	49.5	49.1	48.9	48.5	47.5	46.5	45.6
1600	43.5	42.8	42.2	41.6	40.5	40.2	39.1	38.7	38.1	37.6	36.5	34.7	33.5	32.0
2000	29.2	28.6	27.4	26.4										
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	83.7	83.7	83.7	83.2	83.7	83.7	84.5	84.8	85.0	84.6	84.3	84.3	84.5	84.5
(4) A-WTD	75.4	75.4	75.0	74.6	74.7	74.6	75.1	75.1	75.2	74.7	74.2	74.0	73.9	74.0
(5) PNL	84.9	85.0	84.8	84.4	84.4	84.6	85.2	85.5	86.1	85.7	85.4	85.2	85.2	85.3
(6) PNLT	85.7	85.5	85.8	85.6	85.6	85.5	86.1	86.4	86.8	86.5	86.2	85.2	85.2	85.9
(7) ACC RNG	6249	6331	6417	6505	6595	6688	6784	6881	6981	7083	7187	7293	7400	7510
(8) SPT RNG	7578	7719	7862	8009	8158	8309	8463	8618	8776	8935	9056	9258	9421	9586

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY 2 31 58.000 MODEL DC-8-61 REG. N8037U FLT 2 RUN 28 MIC 3 LOC 2 TEST DATE 11-08-73 11100408 PAGE 8

							(1)							
1/3 O.B. CMF (HZ) / START TIME	41.5	42.0	42.5	43.0	43.5	44.0	44.5	45.0	45.5	46.0	46.5	47.0	47.5	48.0
50	71.5	[illegible]	73.6	74.7	73.5	73.6	73.7	74.4	74.0	74.1	73.4	73.5	72.6	73.6
63	72.2	71.5	72.2	71.7	71.5	71.4	73.6	73.7	74.6	74.2	75.3	74.7	74.6	74.3
80	68.2	68.6	68.7	69.0	69.1	69.4	71.4	71.6	72.5	71.8	72.3	73.2	72.7	72.9
100	64.2	64.5	66.1	65.8	65.1	63.2	63.9	64.0	64.4	65.0	65.9	66.7	66.7	66.4
(2)—125	75.3*	74.9	74.6	74.0	73.1	71.2	70.3	70.7	70.7	71.3	70.0	69.5	68.6	69.1
160	76.2	78.9	79.4	79.7	79.2	78.4	77.7	77.6	77.5	77.5	76.7	77.1	76.7	76.3
200	76.4	76.0	78.0	76.8	79.6	79.1	78.7	77.6	77.9	78.0	78.0	77.8	78.0	77.9
250	72.2	72.4	72.8	73.2	73.7	73.5	73.7	73.4	74.0	74.3	74.5	74.8	75.0	74.8
315	69.4	69.3	68.7	68.1	66.2	65.3	64.3	64.1	63.7	64.4	64.7	65.7	66.1	66.9
400	71.3	71.7*	72.0*	72.2*	71.4*	71.2*	70.3*	70.8*	70.2*	70.1*	69.0*	69.0*	69.0*	68.3
500	65.9	65.5	65.0	64.9	64.6	64.8	64.3	64.3	64.3	64.7	64.5	65.0	65.4	65.5
630	63.7	63.7	62.8	62.9	63.1	63.7	63.5	62.6	63.0	62.6	61.9	61.4	61.2	59.7
800	60.7	60.4	59.3	58.8	57.3	57.2	56.8	57.1	56.3	55.6	53.6	53.5	53.6	53.0
1000	55.0	54.5	53.4	52.6	51.2	51.1	50.3	49.8	49.0	48.6	47.5	47.5	47.1	46.2
1250	45.1	44.9	43.8	43.4	42.4	42.4	41.4	40.6	39.0	38.4	37.0	36.2	36.3	35.7
1600	31.4	30.8	29.5	29.6										
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	84.1	84.2	84.5	84.8	84.7	84.1	84.0	83.9	84.0	84.0	83.8	83.9	83.8	83.7
(4)—A-WTD	73.6	73.7	73.7	73.9	73.8	73.4	73.0	72.8	72.7	72.8	72.5	72.5	72.6	72.4
(5)—PNL	84.8	84.7	84.7	85.0	85.2	84.7	84.4	84.0	84.0	84.1	83.8	83.8	83.9	83.7
(6)—PNLT	85.5	85.4	85.5	86.0	86.2	85.8	85.4	85.1	85.1	85.0	84.5	84.4	84.4	83.7
(7)—ACC PNC	7621	7734	7848	7964	8080	8199	8318	8438	8555	8682	8805	8925	9053	9178
(8)—LPT PNC	9752	9920	10089	10259	10430	10601	10774	10947	11121	11295	11470	11646	11822	11999

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 3 TEST DATE 11-30-73 11100408
START TIME 2 31 58.000 REG. N8087U RUN 28 LOC 8 PAGE 9

1/3 O.B. CNF(HZ)	48.5	49.0	49.5	50.0	50.5	51.0	51.5	52.0	52.5	53.0	53.5	54.0	54.5	55.0
50	74.5	74.3	74.6	73.6	72.7	73.4	74.0	75.3	74.2	73.5	71.5	71.5	71.5	70.7
63	75.7	75.9	75.6	73.8	73.5	73.7	74.5	75.2	75.0	73.9	72.9	72.1	74.4	75.4
80	73.0	73.5	73.8	72.8	72.2	72.3	73.7	74.8	74.8	74.3	74.4	74.8	74.6	73.5
100	67.2	68.0	68.6	68.6	69.0	69.3	69.4	65.1	69.6	70.1	70.3	70.4	70.2	69.9
(2)—125	68.2	67.7	66.5	66.3	65.2	64.2	64.3	64.6	65.3	65.2	64.5	63.6	62.7	63.5
160	75.6	75.0	74.7*	74.0	73.1*	72.3	71.9	71.7	72.0	71.1	70.4	69.0	69.0	68.6
200	77.7*	77.0	76.2	76.3	76.0	76.2*	75.7*	75.5*	75.2	74.5	73.9	73.7	73.7	72.8
250	74.7	74.6	74.3	74.3	73.7	76.3	73.4	73.2	72.8	72.6	72.3	72.4	72.5	72.8
315	67.1	67.0	66.7	66.7	67.0	67.1	67.3	67.2	67.4	67.4	67.8	67.8	67.4	67.6
400	67.2	66.3	65.8	65.3	64.7	64.9	64.5	63.7	62.2	61.1	59.7	59.0	58.4	57.7
500	64.7	64.2	63.6	63.7	62.8	62.6	62.5	62.5	62.4*	61.9*	61.9*	61.7*	61.3*	60.0*
630	59.3	57.8	57.5	56.9	55.9	55.3	54.5	54.0	53.6	52.9	53.1	53.4	53.1	53.0
800	52.7	51.7	52.0	51.9	51.5	50.9	50.7	50.7	50.5	50.1	50.1	50.6	50.3	49.6
1000	45.4	45.2	45.4	45.1	44.2	43.3	43.1	42.6	41.5	43.3	39.7	39.5	39.1	38.4
1250	36.0	36.4	36.2	35.6	33.3									
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	83.8	83.6	83.2	82.7	82.1	82.3	82.4	82.8	82.5	81.9	81.4	81.2	81.5	81.3
(4)—A-WTD	72.1	71.6	71.1	71.0	70.5	70.6	70.2	70.0	69.7	69.3	68.9	68.8	68.7	68.5
(5)—PNL	83.6	83.1	82.5	82.3	81.8	81.9	81.7	81.6	81.4	80.7	80.1	79.8	79.8	79.5
(6)—PNLT	84.1	83.1	83.0	82.3	82.4	82.6	82.3	82.2	82.6	82.3	81.5	81.7	81.7	81.2
(7)—ACC RNG	9334	9431	9558	9686	9814	9943	10373	10203	10333	10464	10595	10727	10659	10991
(8)—CPT RNG	12177	12355	12535	12715	12895	13077	13258	13440	13623	13806	13990	14175	14360	14545

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY START TIME 2 31 58.000	MODEL DC-8-61 REG. N8087U		FLT 2 RUN 28			MIC 3 LOC 8			TEST DATE 11-08-73			11130438 PAGE 10		
1/3 O.B. CNF (HZ)	55.5	56.0	56.5	57.0	57.5	58.0	58.5	59.0	59.5	60.0	60.5	61.0	61.5	62.0
50	72.7	72.6	73.3	72.1	74.0	74.6	75.0	73.6	73.7	73.0	72.6	70.5	71.0	71.1
63	75.9	74.9	74.2	73.8	74.3	74.2	75.0	74.3	74.3	73.5	74.2	73.4	73.9	73.4
80	73.4	73.9	74.3	74.7	74.6	74.4	73.9	73.6	74.2	74.4	73.7	73.1	71.8	72.1
100	69.7	69.7	70.5	70.3	70.1	69.8	70.1	71.1	72.1	72.3	71.2	70.2	70.8	71.9
(2) — 125	62.7	63.2	63.8	64.4	64.0	64.2	64.5	65.8	66.5	66.5	66.1	65.6	65.9	66.1
160	58.0	68.2	68.3	68.4	68.2	67.4	66.5	65.3	65.3	65.2	64.7	64.2	64.1	64.2
200	71.5	71.3	72.2	72.7	72.5	71.5	70.4	70.2	70.5	70.6	70.1	69.5	68.7	68.1
250	72.7	72.3	72.1	72.3	72.5	72.4	71.5	70.9	70.3	70.2	70.4	70.5	70.2	69.7
315	67.9	68.6	68.7	69.0	69.4	69.8	69.7	68.6	67.7	67.6	67.5	67.8	67.4	67.3
400	57.8	57.8	58.4	58.7	59.1	59.4	59.0	58.3	57.8	57.7	58.2	58.6	59.1	59.3
500	59.4*	59.5*	59.9*	59.5*	59.1	59.0	58.4	57.5	56.3	56.0	56.0	55.6	55.2	54.6
630	52.9	53.5	53.7	53.7	53.8	53.7	53.7	53.3	52.9	53.5*	53.9*	53.5*	53.5	52.7
800	49.2	48.7	48.6	47.1	46.8	46.1	45.1	43.7	42.3	42.0	42.3	41.9		
1000														
1250														
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) — OVERALL	81.4	81.2	81.4	81.3	81.7	81.6	81.5	81.0	81.1	80.5	80.7	79.5	79.8	79.8
(4) — A-WTD	68.2	68.2	68.4	68.6	68.7	68.6	68.0	67.3	66.9	66.9	66.8	66.7	66.4	66.1
(5) — PNL	79.5	79.3	79.4	79.5	79.7	79.5	78.9	78.3	78.0	77.9	77.8	77.6	77.2	76.9
(6) — PNLT	80.8	80.6	80.6	80.6	79.7	79.5	78.9	78.3	78.0	78.9	78.9	78.8	77.2	76.9
(7) — ACC RNG	11123	11256	11389	11522	11656	11790	11924	12059	12194	12329	12464	12600	12736	12872
(8) — CPT RNG	14731	14918	15105	15292	15480	15668	15856	16045	16234	16423	16612	16801	16991	17181

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY	MODEL CC-8-61 REG. N8C87U	FLT 2 RUN 28	MIC 3 LOC 8	TEST DATE 11-08-73	11100400 PAGE 11									
START TIME 2 31 58.000														
1/3 O.B. CMF(HZ)	62.5	63.0	63.5	64.0	64.5	65.0	65.5	66.0	66.5	67.0	67.5	68.0	68.5	69.0
50	71.7	72.3	72.7	72.4	71.1	70.7	70.1	70.8	70.6	71.0	70.6	70.7	71.0	71.5
63	73.7	74.1	73.9	73.3	71.5	73.0	74.3	74.3	73.6	72.5	72.2	73.2	73.1	73.0
80	73.0	73.7	75.2	75.2	74.9	73.8	73.2	73.0	73.5	73.7	73.9	74.3	73.8	73.6
100	72.4	71.5	70.9	70.6	70.5	70.9	70.3	70.4	70.1	70.1	70.6	71.5	71.5	70.9
(2) 125	65.6	65.7	66.0	66.3	67.0	67.0	66.7	65.3	64.5	66.3	66.8	67.5	67.3	67.4
160	63.3	62.5	61.6	61.5	61.0	61.3	60.7	60.8	60.2	60.0	59.1	59.8	60.4	60.5
200	67.8	67.7	68.1	68.2	67.8	66.9	66.2	66.0	65.8	65.8	65.2	64.6	63.1	62.4
250	69.9	70.3*	69.9	69.5	68.8	68.6	67.9	66.7	66.4	66.9	67.6	67.3	66.3	65.1
315	66.9	66.4	66.8	66.7	67.4	67.1	66.8	66.5	66.6*	66.8	66.4	65.7	65.3	[illegible]
400	59.6	59.2	59.2	59.3	59.7	59.7	59.5	59.7	60.3	60.6	60.9	60.3	60.0	58.7
500	54.4	53.6	53.5	53.2	52.7	51.8	50.3	50.2	50.3	50.1	49.1	48.0	47.1	46.6
630	53.2	52.6	52.8	52.6	52.8	52.4	51.1	50.9	51.6	51.6	50.9	48.7	48.3	47.4
800														
1000														
1250														
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	80.2	80.4	80.7	80.4	79.5	79.7	79.6	79.5	79.3	79.3	79.3	79.7	79.5	79.3
(4) A-WTD	66.1	66.0	66.1	65.9	65.8	65.5	65.0	64.6	64.6	64.8	64.8	64.5	63.9	63.2
(5) PNL	77.1	77.2	77.1	76.8	76.3	76.1	75.5	75.1	75.1	75.3	75.2	75.0	74.3	73.8
(6) PNLT	77.1	77.8	77.1	76.8	76.3	76.1	75.5	75.1	75.6	75.3	75.2	75.0	74.3	73.8
(7) ACC RNG	13009	13146	13283	13420	13558	13695	13833	13972	14110	14249	14388	14527	14666	14806
(8) DST RNG	17371	17561	17752	17942	18133	18324	18515	18707	18898	19089	19281	19474	19664	19858

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

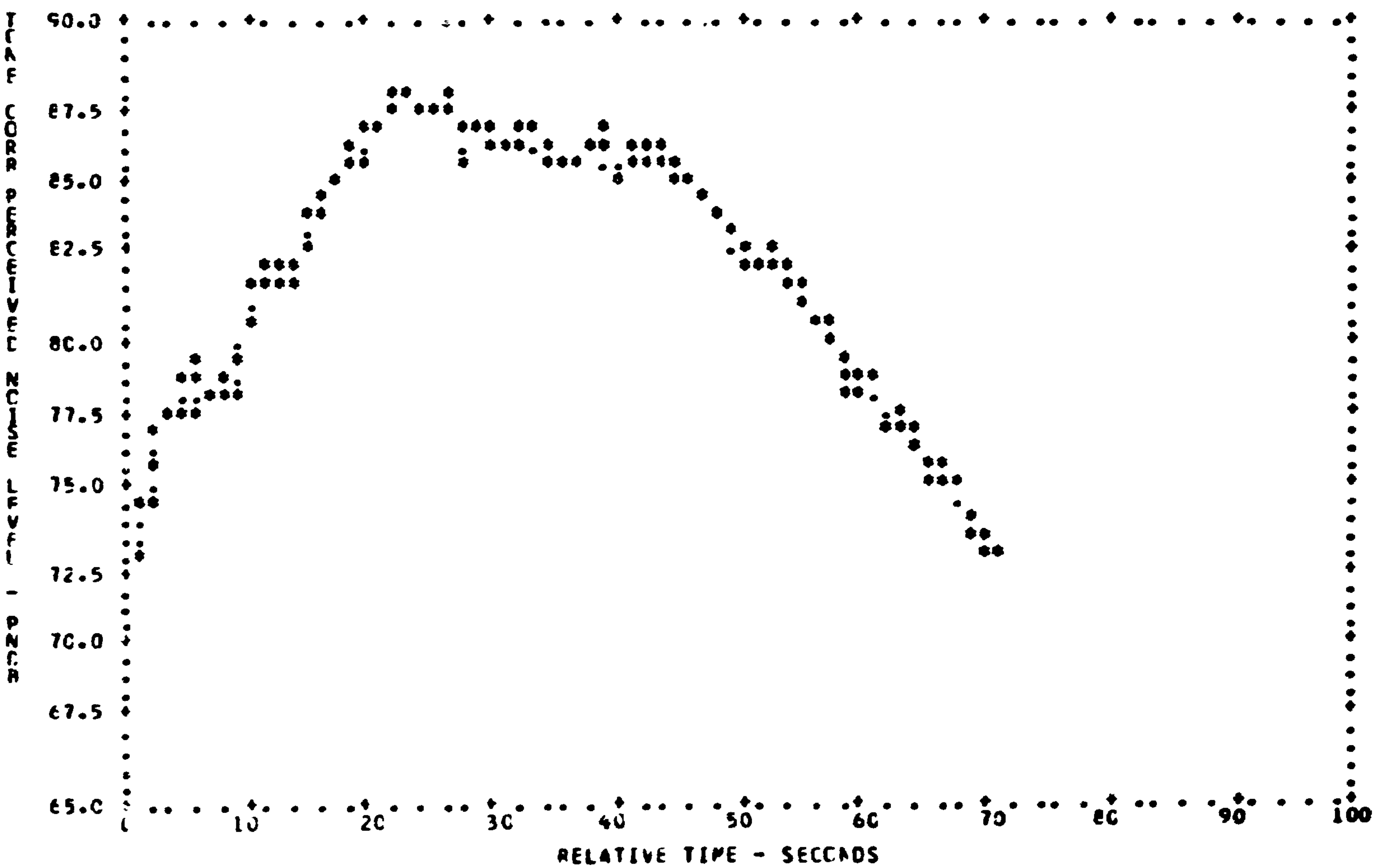
MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 3 TEST DATE 11-08-73 11103408
START TIME 2 31 58.000 REG. N8067U RUN 28 LOC 8 PAGE 12

1/3 O.B. CMF(HZ)	69.5	70.0	70.5	71.0
50	71.6	71.4	70.6	68.9
63	71.5	70.9	71.6	72.4
80	72.7	72.6	72.8	72.6
100	68.9	69.7	69.5	70.6
(2)——125	66.7	66.4	66.0	66.0
160	59.7	58.9	59.2	59.0
200	62.5	62.6	62.9	62.3
250	64.6	65.1	64.5	63.8
315	64.6	64.4	63.9	63.2
400	59.0	58.1	57.8	56.3
500	46.5	46.4	45.6	44.4
630	47.0	45.9	45.6	44.9
800				
1000				
1250				
1600				
2000				
2500				
3150				
4000				
5000				
6300				
8000				
10000				
(3)——OVERALL	78.4	78.3	78.3	78.2
(4)——A-WTD	62.8	62.7	62.4	61.9
(5)——PNL	73.3	73.1	72.9	72.3
(6)——PNLT	73.3	73.1	72.8	72.3
(7)——ACC PNC	14945	15065	15226	15366
(8)——CPT PNC	20051	20244	20436	20629

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(9)

MODEL DC-8-61 REG N8C87U FLT 2 RUN 28 MIC 3 LOC B MEASURED DATA



ST TIME= 2 31 58.0 TFALTM = 2 32 20.5 OH TIME= 2 32 17.8 1110C408

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

FAR PART 36 FLYOVER NOISE LEVELS

DATA IDENTIFICATION INFORMATION

DATA DIGITIZED 12-17-73 DATA PROCESSED 04/08/75 11100408 PAGE 1

MODEL DC-8-61 REG. NO. N8C87U

DC-8-61 FLYOVER NOISE DEFINITION

MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS

ENGINE/NACELLE CONFIGURATION -- P&WA JT3D-3B ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- LEVEL FLIGHT DATA CLASS -- FN/DLT = 10000 LBS
MEASUREMENT TYPE -- BENEATH FLT PATH, 4 FEET ABOVE SANDY DIRT
RECORDING AT X = 2450.0, Y = 219.0, Z = 2.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE RECORDING LOCATION X = 2450.0, Y = .0, Z = .0 FEET

MEASUREMENT INFO		AIRPLANE AND ENGINE DATA		WEATHER DATA
MIC. NUMBER 10	FLSE. NO. 373	AVG. N1RT = 5700. RPM		AMB. TEMP. = 58.7 F
MIC. LOCATION 0	FLIGHT 2	AVG. EPR = N/A		REL. HUM. = 43.2 PCT
MIC. ORIENT GRAZING	RUN 29	A/P HEADING = 210. DEG		ABS. HUM. = 5.1 GM/M3
TEST SITE YUMA	HEIGHT = 5279.7 FT	FLAP POS. = 48.0 DEG		WIND SPEED = 3. KN
TEST DATE 11-08-73	LAT. DEV. = 341.2 FT	PATH ANG. = -.0 DEG		WIND DIR. = 60. DEG
TEST NUMBER 10.4.1	SLNT.RNG. = 5290.7 FT	PITCH ANG. = -1.2 DEG		STA. PRESS = 29.75 IN HG
JOB REEL A4737	PATH SPD. = 189.6 KN	GR. WEIGHT = 221400. LB		RT. THETA = 1.0099

AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF 2-44-25.4
OTHER PERFORMANCE DATA IS FOR TIME OF PNLTM OF 2-44-25.5
TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION 2-44-25.4

REFERENCE SURFACE WEATHER CONDITIONS TEMP = 77.0 F & REL. HUM. = 70.0 PCT

DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION GR1921(CISA) / 0.25 DB
CISA MODE 1 PASS WITH AUTO-START
SAMPLE INTERVAL FOR BASIC DATA = .500 SECONDS
AVERAGING TIME = 1.500 SECONDS

ATMOSPHERIC ATTENUATION SAE ARP866(REV)
BASIC UNIT SOUND PRESSURE LEVEL
(DB REL. 0.0002 MICROBAR)
DATA TYPES 1/3 OCTAVE, OVERALL, A-WTD,
PNL, PNLT & EPNL

RUN 29C

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 10 TEST DATE 11-08-73 11100400
START TIME 2 43 59.000 REG. N8C87U RUN 29 LOC C PAGE 2

1/3 O.B. CNF(HZ)	AMB SPL	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
50	58.2						61.9	61.7						
63	60.3													
80	57.2													
100	54.3													
(2)— 125	51.4													
160	48.8			52.3	53.0	53.4	53.8	55.0	55.0	55.3	55.7	56.5	57.3	58.2
200	49.6	57.5	60.2	61.5	61.8	61.6	61.1	61.9	61.7	61.3	62.5	63.4	64.2	64.0
250	50.1	59.0	60.4	60.7	61.1	60.6	61.2	61.6	61.7	61.1	60.8	61.5	62.4	62.6
315	49.3	54.5	56.8	57.6	57.4	56.3	56.0	56.1	56.0	55.5	55.8	55.6	55.7	55.3
400	45.9												49.8	51.6
500	37.7	48.1	49.1	45.8	49.9	50.3	50.5	50.6	51.2	51.8	52.9	53.4	54.6	54.8
630	35.5	44.2	44.8	45.7	46.1	46.4	46.0	45.6	45.6	45.9	46.1	46.1	46.0	46.2
800	30.2	35.8	37.0	38.2	39.2	41.2	42.0	41.5	41.6	41.9	42.8	44.5	45.5	45.7
1000	27.3					31.0	31.5	32.4	33.5	34.4	35.5	36.0	38.4	38.9
1250	27.7													
1600	22.1													
2000	19.9													
2500	18.0													
3150	17.0													
4000	17.2													
5000	17.7													
6300	17.9													
8000	18.0													
10000	19.7													
(3)—OVERALL	64.9	62.6	64.4	65.6	65.7	65.3	67.0	67.3	65.5	65.5	66.0	66.7	67.6	67.7
(4)—A-WTD	48.9	54.5	56.1	57.0	57.1	56.7	56.8	57.2	57.2	56.5	57.4	[illegible]	59.0	59.1
(5)—PNL	56.5	60.8	62.4	63.5	63.8	63.9	64.3	64.7	64.8	64.4	64.6	65.5	66.9	67.0
(6)—PNLT	57.5	60.8	62.4	63.5	63.8	63.5	64.3	64.7	64.8	64.4	64.6	65.5	66.9	67.0
(7)—ACC RNG		13550	13354	13158	12963	12768	12574	12381	12188	11957	11807	11619	11433	11253
(8)—OPT RNG		10134	10001	9869	9738	9607	9477	9348	9219	9090	8963	8836	8710	8586

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL DC-9-51 FLT 2 MIC 13 TEST DATE 11-06-73 [illegible]
START TIME 2 43 59.000 REG. N6C87U RUN 29 LOC C PAGE 3

1/3 O.B. CF (HZ)	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
50														
63										63.2	63.2	62.2		
80		60.8	60.8	60.9				60.9	61.7	60.6		64.3		
100														
(2) 125								55.3	55.5	55.0	55.3	55.5	57.1	57.5
160	59.3	59.5	59.9	60.4	61.6	62.4	62.6	62.6	62.3	63.2	63.5	63.8	65.0	65.4
200	63.9	63.6	63.6	64.2	64.8	65.5	65.6	65.8	65.6	66.4	66.6	66.8	67.0	67.0
250	62.2	61.9	61.6	62.2	62.1	63.3	64.0	64.5	64.1	63.4	63.2	63.9	64.2	[illegible]
315	55.4	54.7	54.1	53.4	53.1	53.9	54.0	54.2	53.6		53.2	54.7	55.8	56.1
400	52.7	53.2	53.7	54.3	56.1	57.3	59.3	60.1	60.4	59.5	60.7	61.4	62.4	61.9
500	55.2	54.5*	54.6*	54.0	53.9	53.7	54.3	54.1	54.1	53.6	54.0	53.8	54.3	54.5
630	46.4	46.7	47.0	48.0	48.4	49.6	50.7	52.0	52.3	53.1	54.2	54.5	55.3	56.7
800	45.3	44.3	43.9	43.8	44.1	44.7	45.7	46.5	47.0	47.0	47.7	48.0	49.0	45.3
1000	39.3	38.7	38.6	39.2	39.2	39.6	40.9	41.8	42.1	41.3	41.6	41.9	42.9	47.9
1250							32.2	33.1	33.3	33.1	34.2	34.8	36.3	36.3
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	67.7	68.3	68.3	68.7	68.6	69.4	69.8	70.7	70.7	71.4	71.2	72.2	71.5	71.5
(4) A-WTD	59.2	59.8	59.9	59.2	59.7	60.4	61.2	61.7	61.4	61.4	61.9	62.5	63.1	62.9
(5) PNL	67.3	67.2	67.2	67.7	67.9	68.7	69.3	70.5	70.4	70.2	70.7	71.3	71.5	71.4
(6) PNLT	67.0	68.3	68.3	67.7	67.9	69.7	69.3	70.5	70.4	73.2	70.7	71.3	71.5	71.5
(7) [illegible] RNG	11064	10882	10702	10523	10345	10168	9994	9821	9645	9480	9311	9144	8978	8814
(8) UPT RNG	8462	8340	8220	8100	7981	7864	7748	7632	7515	7411	7311	7225	7150	7066

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 13 TEST DATE 11-08-73 11100408
START TIME 2 43 59.000 REG. N8027U RUN 29 LOC C PAGE 4

1/3 O.B. CNTR(HZ)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0
50	62.7	63.0	62.4	61.8		62.5					62.5	63.1	63.3	62.3
63														
80														
(2) 100											58.0	59.2	61.7	63.1
125	59.1	55.9	62.4	60.1	60.9	62.2	63.1	64.7	64.8	64.9	64.6	65.2	65.9	66.5
160	65.8	65.1	64.5	64.2	65.7	66.5	67.5	67.2	67.9	68.3	68.9	69.0	69.7	70.0
200	67.5	67.7	67.8	67.5	68.0	67.7	68.6	67.5	69.0	68.3	68.6	67.7	68.4	68.4
250	63.8	63.1	63.5	63.0	62.2	61.7	61.3	61.3	63.5	60.5	60.8	61.5	62.3	63.3
315	58.2	59.5	60.3	60.6	61.4	62.8	63.9	65.1	65.8	66.4	66.8	67.2	67.6	67.8
400	61.8	62.0	62.3	62.9	62.0	62.1	61.7	61.7	61.9	61.8	61.6	61.2	60.3	60.5
500	55.3	55.5	55.9	57.8	59.3	60.9	61.6	62.2	63.3	62.5	62.7	63.2	63.5	63.0
630	54.5	54.1	54.5	54.4	54.3	54.6	55.4	56.2	57.1	57.6	58.0	58.5	58.8	59.4
800	50.4	51.0	51.5	51.4	51.5	52.5	53.4	54.3	54.5	54.8	54.5	55.2	55.1	55.3
1000	43.8	44.7	45.9	46.4	46.8	47.5	48.1	48.1	48.1	48.6	45.4	50.1	50.4	51.5
1250	37.7	37.8	38.6	38.9	39.1	40.4	41.2	42.4	42.6	42.8	43.3	44.0	44.3	44.3
1600	25.5	25.8	26.5	27.6	28.3	29.2	30.0	31.5	33.2	33.9	34.5	35.6	36.5	38.1
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	72.4	72.3	72.5	72.3	72.4	73.1	73.5	73.6	74.2	74.2	74.5	74.5	75.5	75.8
(4) A-WTD	63.2	63.3	63.7	63.8	64.0	64.6	65.2	65.6	66.0	66.2	66.4	66.6	66.9	67.1
(5) PNL	72.0	72.0	72.8	72.6	73.1	73.2	74.1	74.0	74.7	74.5	75.3	75.6	76.1	76.3
(6) PNLT	72.0	72.0	72.8	72.6	73.1	73.2	74.1	74.0	74.7	74.5	75.3	75.6	76.1	76.3
(7) ACC RNG	8652	8493	8337	8183	8031	7882	7734	7585	7452	7326	7223	7134	7010	6788
(8) CPT RNG	6923	6767	6656	6561	6480	6395	6310	6225	6142	6062	5985	5912	5842	5775

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1) (10)

MEASURED SPL HISTORY — START TIME 2 43 59.000 — MODEL DC-8-61 REG. N8087U — FLT 2 RUN 29 — MIC 10 LOC C — TEST DATE 11-08-75 — 11100408 PAGE 5

1/3 O.B. CNF (HZ)	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0
50				61.7										
63														
80									63.7	62.7	63.4	63.7	63.2	62.6
(2) 100	65.4	65.2	65.5	65.2	66.5	67.3	68.2	66.9	68.5	69.4	66.8	68.9	67.9	66.0
125	67.1	67.7	65.2	65.8	70.2	69.5	70.3	70.7	71.0	70.1	65.4	70.0	71.5	72.1
160	70.6	70.9	71.3	71.1	71.1	70.8	71.6	71.2	71.1	69.5	70.4	70.1	70.3	69.6
200	68.5	66.1	67.5	66.5	65.7	65.2	65.8	65.2	65.0	66.2	63.8	64.4	64.4	64.2
250	63.8	65.7	66.6	67.7	68.1	65.0	69.5	65.8	69.5*	70.1*	71.0*	71.7*	72.0*	71.7*
315	67.4	67.8	68.3	68.8	68.6	68.2	67.8	67.4	66.7	66.4	66.3	66.3	65.7	65.1
400	60.8	61.7	62.8	63.7	64.4	65.2	65.9	66.3	66.2	66.2	66.4	66.7	66.6	67.0
500	62.4	61.9	62.1	62.5	62.5	62.5	62.7	62.8	63.0	62.5	63.5	64.2	64.4	64.1
630	59.7	60.3	60.8	61.0	61.0	60.7	61.0	61.4	61.4	61.2	61.4	61.6	61.4	61.2
800	55.6	56.8	57.2	57.8	58.3	58.6	58.3	58.1	57.5	57.9	57.6	58.1	56.5	55.5
1000	52.7	54.3	54.7	55.0	55.1	55.5	55.3	55.1	54.5	55.1	55.3	55.6	55.5	55.5
1250	44.3	45.4	46.0	47.3	48.4	49.5	49.4	49.6	49.5	49.7	50.7	51.3	52.4	52.4
1600	38.8	41.5	44.3	45.5	46.2	45.5	44.4	43.5	42.5	42.3	43.2	43.9	43.9	43.5
2000			23.4	24.0	24.5	26.1	28.0	26.4	28.4	27.4	27.7	28.4	28.4	28.1
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	76.0	76.2	76.8	77.1	77.2	77.2	77.7	77.8	77.8	77.5	77.6	78.0	78.2	78.2
(4) D-LVL	67.1	67.6	68.1	68.5	68.6	68.7	69.0	69.0	68.5	68.8	69.1	69.5	69.6	69.5
(5) PNL	76.4	77.0	77.6	78.0	78.0	78.0	78.3	78.4	78.4	78.6	79.1	79.7	79.9	79.7
(6) PNLT	76.4	77.0	77.6	78.0	78.0	78.0	78.3	78.4	79.0	79.4	80.1	80.7	81.1	80.8
(7) ACC RNG	6646	6533	6449	6345	6242	6145	6052	5964	5880	5802	5730	5664	5603	5548
(8) CPT RNG	5713	5654	5600	5550	5503	5461	5423	5390	5361	5337	5318	5304	5295	5291

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY — START TIME 2 43 59.000 — MODEL DC-8-61 REG. N8087U — FLT 2 RUN 29 — MIC 10 LOC C — TEST DATE 11-08-73 — 11102438 PAGE 6

1/3 O.B. CNE (HZ)	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5	32.0	32.5	33.0	33.5	34.0
50														
63														
80	62.3	63.6	64.6	64.4	64.1	64.9	64.9	64.3	63.5	64.4	64.9	64.2	63.2	63.2
100	68.7	69.5	70.1	70.4	70.0	70.4	70.0	69.2	68.5	70.2	71.8	71.4	71.0	69.9
(2)—125	72.4	72.1	72.2	71.7	72.6	72.8	73.4	73.4	74.0*	73.3	73.2	72.9	73.0	72.1
160	69.5	69.2	68.0	68.0	68.4	69.7	69.2	69.7	69.7	70.3	70.1	71.0	70.8	71.2
200	63.8	64.4	65.3	66.6	66.8	66.7	66.0	65.8	66.0	66.6	67.1	66.8	66.3	65.5
250	71.3*	70.5*	70.3*	70.6*	70.1*	70.4*	70.2*	70.6*	70.0	69.6*	70.1*	70.4*	70.2*	69.9*
315	65.0	65.3	65.4	65.4	65.1	64.7	64.2	65.2	65.4	65.8	66.1	66.5	64.7	66.0
400	66.8	67.2	67.4	67.7	67.5	66.5	66.5	66.2	66.4	66.4	66.3	66.2	66.2	66.7
500	64.9	66.2	66.4	65.9	65.0	65.0	65.4	65.8	65.5	65.4	65.1	65.5	65.4	65.1
630	61.4	62.2	63.1	63.4	63.1	62.9	63.0	63.1	62.7	62.6	62.5	62.4	61.9	62.0
800	60.9	61.7	62.0	61.6	61.2	61.1	60.5	60.4	60.6	60.8	60.7	60.2	60.2	60.0
1000	55.5	55.9	56.1	56.2	56.8	57.5	57.8	57.8	58.3	58.7	58.2	57.4	56.3	56.3
1250	52.3	51.6	50.5	49.8	50.3	50.7	50.9	50.1	50.1	50.6	50.9	51.4	52.0	52.2
1600	42.9	42.9	42.1	42.1	42.5	43.0	43.1	42.7	42.1	41.8	41.3	41.3	41.5	41.5
2000	30.1	30.5	33.3	29.2	29.5	29.5	29.2	28.0	27.6	27.6	28.7	28.6	28.7	28.1
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	78.2	78.3	78.3	78.4	78.4	78.6	78.6	78.6	78.7	78.7	75.0	79.0	78.9	78.5
(4)—A-WTD	69.7	70.0	70.2	70.2	69.9	69.8	69.8	70.0	69.9	69.9	65.5	70.0	69.8	69.7
(5)—PNL	79.6	79.4	79.4	75.6	79.3	79.5	79.4	75.6	75.3	79.3	75.5	79.7	79.5	79.2
(6)—PNLT	80.7	80.4	80.2	80.4	80.0	80.3	80.2	80.4	80.1	79.8	80.1	80.3	80.1	79.4
(7)—ACC RNG	5497	5423	5413	5319	5351	5328	5311	5259	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(8)—CPT RNG	5292	5256	5338	5323	5343	5368	5337	5231	5470	5513	5560	5611	5686	5725

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 13 TEST DATE 11-08-73 1110J408

START TIME 2 43 59.000 REG. N8C87U RUN 29 LOC C PAGE 7

1/3 O.B. CTR (HZ)	34.5	35.0	35.5	36.0	36.5	37.0	37.5	38.0	38.5	39.0	39.5	40.0	40.5	41.0
50												61.8		
63														
80	63.6	65.3	65.4	65.9	64.5	64.7	65.6	65.9	65.0	64.9	64.9	65.1	63.1	62.9
(2)—100	70.2	70.7	70.5	70.3	70.2	71.4	71.9	71.3	70.5	70.2	70.7	70.4	70.0	69.6
125	71.1	71.1	71.7	72.1	72.1	72.2	72.5	72.3	72.5	72.0	72.3	72.5	73.7	73.9
160	70.3	71.1	70.8	71.2	70.2	70.7	70.5	71.0	71.4	71.7	71.6	71.5	71.7	72.6
200	65.6	66.0	66.1	66.1	65.8	66.4	65.8	65.8	64.7	64.8	64.4	64.4	64.7	65.3
250	69.6*	69.9*	70.1*	70.3*	70.2*	70.3*	70.4*	70.5*	70.6*	71.4*	71.4*	71.1*	69.8*	70.1*
315	65.5	64.6	64.4	64.5	64.7	64.0	63.4	63.9	65.0	65.8	66.2	66.2	66.8	66.5
400	66.5	65.9	65.1	65.3	66.4	67.0	67.1	66.6	66.4	66.8	66.8	67.2	67.1	67.6
500	64.6	64.2	63.7	64.0	64.2	64.3	64.2	64.1	64.3	64.0	63.9	63.4	63.3	63.7
630	61.7	61.7	61.1	61.1	61.2	61.4	61.9	61.9	62.1	62.0	61.6	[illegible]	61.6	62.2
800	59.3	58.6	58.7	59.2	59.5	59.6	59.4	55.5	59.2	59.0	57.5	57.1	56.9	57.7
1000	55.9	56.0	56.3	56.2	56.0	55.4	54.8	54.7	55.0	54.9	54.1	52.9	52.7	52.6
1250	51.4	49.7	49.2	49.8	50.4	50.1	49.9	49.3	49.2	48.3	47.4	46.9	47.0	47.3
1600	41.1	39.7	39.1	38.8	39.1	38.5	38.1	38.0	38.3	38.1	37.5	36.8	36.6	36.7
2000	27.6	27.0	26.3	26.1	26.3	25.9	25.6	25.3	25.3	24.9	24.2			
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	78.0	78.3	78.3	78.5	78.3	78.6	78.8	78.7	78.7	78.7	78.9	78.9	78.9	79.2
(4)—A-WTD	69.3	69.1	68.8	69.0	69.2	69.3	69.3	69.3	69.4	69.6	69.5	69.3	69.2	69.5
(5)—PNL	78.8	78.9	78.9	79.1	79.0	79.2	79.2	79.2	79.2	79.6	79.4	79.4	78.8	79.1
(6)—PNLT	79.5	79.1	79.7	79.9	79.9	80.0	80.2	80.2	80.2	80.7	80.6	80.4	79.5	79.8
(7)—ACL ENG	5352	5377	5407	5440	5477	5517	5561	5607	5657	5710	5765	5823	5884	5947
(8)—OPT ENG	5789	5854	5923	5997	6074	6154	6238	6324	6414	6506	6600	6698	6798	6901

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY　MODEL DC-8-61　FLT 2　(1)　MIC 10　TEST DATE 11-08-73　11100400
START TIME 2 43 59.000　REG. N8087U　RUN 29　LOC C　PAGE 8

1/3 O.B. CMF(HZ)	41.5	42.0	42.5	43.0	43.5	44.0	44.5	45.0	45.5	46.0	46.5	47.0	47.5	48.0
50				61.6		62.6	62.2	62.5	63.2	64.7	66.1	66.5	66.5	66.3
63											63.8			
80	61.6	61.3		60.6										
100	68.6	68.3	68.3	68.7	68.9	68.3	68.6	66.0	67.7	67.7	67.3	68.2	67.2	67.0
(2) 125	73.8	73.4	73.3	73.1	73.5	72.4	71.8	71.3	71.3	72.1	72.2	71.5	70.3	70.7
160	72.6	72.4	73.2	73.2*	73.2	72.5	72.4	73.2	72.8	73.1	73.4	73.7	73.5	72.3
200	65.1	66.9	64.9	66.0	66.2	66.5	66.3	67.1	67.9	68.4	66.3	68.6	68.5	65.3
250	69.7*	69.6*	68.4	68.5	67.7	67.5	66.0	65.7	64.4	63.9	63.0	62.4	61.5	60.1
315	67.3	67.5	67.9	68.0	68.3	68.7	68.7	65.2	69.0	69.2	68.3	67.8	67.6	67.4
400	66.6	66.0	65.2	64.5	64.8	65.5	65.1	64.1	62.4	62.3	62.1	61.7	61.5	61.4
500	63.6	63.2	62.5	61.9	62.3	62.5	63.2	63.4	63.0	62.9	63.3	63.5	63.3	62.2
630	62.3	61.6	61.5	61.4	61.3	60.5	60.7	60.7	60.7	60.1	59.6	58.7	56.2	57.7
800	57.9	58.0	57.6	57.7	57.3	57.2	56.7	56.3	55.8	55.2	54.5	54.1	53.3	52.2
1000	52.6	52.0	51.6	51.1	50.5	50.7	50.7	51.2	50.8	50.6	49.8	49.0	48.0	47.2
1250	46.9	47.2	46.9	46.3	45.1	44.6	44.4	44.0	42.9	41.9	41.4	41.2	40.4	39.3
1600	36.4	36.4	35.9	35.4	34.2	33.4	32.8	32.8	32.4	31.4	30.0	29.0	28.3	27.9
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	78.9	78.7	78.6	78.8	78.5	78.4	78.1	78.2	78.0	78.4	78.5	78.3	77.9	77.6
(4) A-WTD	69.4	69.1	68.9	68.8	68.7	68.7	68.6	68.6	68.3	68.3	68.0	67.8	67.5	67.0
(5) PNL	78.8	78.6	78.5	78.7	78.4	77.9	77.7	78.1	77.7	77.9	78.2	78.0	77.6	76.8
(6) PNLT	79.4	79.2	78.5	79.3	78.4	77.9	77.7	78.1	77.7	77.9	78.2	78.0	77.6	76.8
(7) ACC RNG	6012	6080	6151	6223	6297	6374	6452	6531	6613	6696	6781	6867	6955	7044
(8) CPT RNG	7006	7113	7223	7334	7448	7563	7680	7799	7919	8041	8164	8285	8416	8543

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	HISTORY 2 43 59.000		MODEL DC-8-61 REG. N8087U		FLT 2 RUN 29			MIC 10 LOC C		TEST DATE 11-08-73			11100408 PAGE 9	
1/3 O.B. CMF (HZ)	48.5	49.0	49.5	50.0	50.5	51.0	51.5	52.0	52.5	53.0	53.5	54.0	54.5	55.0
50	66.4	67.1	66.4	67.4	66.3	65.3	66.8	66.5	66.7	66.5	66.8	68.6	70.0	69.6
63			64.8	64.8	65.0	65.7	67.3	67.9	68.0	67.8	67.3	66.3	67.2	68.5
80									61.3	60.9			61.7	63.2
100	65.9	66.3	66.3	65.4	64.6	63.3	63.0	62.1	61.5	61.9	62.7	62.5	62.2	61.9
(2)——125	71.5	71.7	70.9	70.7	70.2	70.3	69.7	68.8	68.7	67.8	68.5	67.8	68.2	67.2
160	71.9	72.2	72.7	72.7	72.4	72.1	71.9	71.9	71.5	71.1	70.9	70.8	70.6	69.5
200	69.7	70.9	70.7	71.1	70.5	70.9	70.6	70.4	70.1	69.5	70.1	69.7	69.0	69.0
250	60.3	60.5	60.8	60.9	61.3	61.9	61.7	61.9	62.2	63.5	63.6	63.8	63.2	63.4
315	67.4	66.7	66.3	65.5	65.4	65.1	65.2	64.3	63.4	62.7	62.3	62.4	61.5	61.4
400	61.2	60.8	60.7	60.5	60.8	61.1	61.9	62.1	61.9	61.2	61.1	61.1	61.4	60.9
500	61.6	61.1	60.8	60.7	60.5	60.3	59.5	58.7	58.2	57.5	57.0	56.6	56.5	56.0
630	57.6	56.6	56.2	55.4	55.6	54.9	54.8	53.7	53.7	53.5	53.8	54.0	53.9	53.6
800	51.7	51.5	51.6	51.4	51.3	50.8	51.1	50.8	50.6	49.5	49.1	48.9	48.7	48.6
1000	[illegible]	46.1	45.7	44.8	44.4	43.9	44.7	44.7	44.9	43.7	43.4	42.6	42.2	41.8
1250	36.5	38.0	37.0	36.1	35.0	34.8	35.0	34.8	33.9	32.9	32.1	31.6	31.2	31.3
1600	27.6	26.9	25.8											
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	77.6	77.9	78.2	78.0	77.6	77.5	77.5	77.3	77.2	76.9	77.0	76.7	77.0	76.8
(4)——A-WTD	66.9	66.8	66.7	66.5	66.3	66.3	66.1	65.8	65.5	65.1	65.1	64.9	64.6	64.3
(5)——PNL	76.6	77.0	77.0	77.0	76.6	76.7	76.6	76.3	76.2	76.0	75.8	75.5	75.4	75.3
(6)——PNLT	76.6	77.0	77.0	77.0	76.6	76.7	76.6	76.3	76.3	76.0	75.6	75.5	75.4	75.3
(7)—ACC PNC	7134	7226	7319	7413	7508	7604	7701	7799	7897	7997	8058	8199	8331	8404
(8)——LPT PNC	8671	8800	8930	9061	9193	9326	9460	9594	9729	9865	10001	10138	10276	10414

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 10 TEST DATE 11-30-73 11100404
START TIME 2 43 59.000 REG. N6087U RUN 29 LOC C PAGE 10

1/3 O.B. CMF (HZ)	55.5	56.0	56.5	57.0	57.5	58.0	58.5	59.0	59.5	60.0	60.5	61.0	61.5	62.0
50	69.2	68.3	67.0	66.9	66.5	68.9	69.3	68.3	67.0	67.5	67.7	67.1	68.4	65.0
63	66.7	68.4	67.1	67.1	67.8	68.2	68.4	67.4	67.6	69.7	71.2	70.9	68.8	67.9
80	64.1	64.1	63.7	64.6	64.5	65.1	64.7	64.5	64.4	63.9	65.3	66.0	66.2	66.1
(2) 100	61.8	60.0	58.2					57.9	58.9	59.4	58.8	58.8	59.1	59.5
125	67.4	66.2	66.1	64.7	64.9	64.3	64.4	63.7	63.6	62.8	62.2	62.4	62.5	61.8
160	68.8	68.3	68.8	68.7	68.1	67.4	66.8	66.8	66.3	66.0	65.7	65.4	64.8	64.8
200	69.2	65.7	69.6	65.5	68.9	68.5	67.9	67.7	68.0	67.8	67.6*	66.5	66.3	66.1
250	64.3	64.8	65.5	65.1	64.3	64.6	64.4	64.6	64.3	64.0	62.9	63.0	63.7	64.2
315	60.3	59.6	58.2	56.9	56.4	55.4	55.4	54.9	54.6	53.4				
400	60.6*	60.2*	60.4	60.7*	60.8*	60.2*	60.4*	60.7*	60.5*	59.8*	58.6	58.7	58.2	57.8
500	54.9	54.1	53.2	53.4	53.9	53.3	53.7	53.8	53.2	53.7	53.3	[illegible]	[illegible]	[illegible]
630	53.2	53.6	53.5*	53.3	52.7	52.7	53.3	53.0	52.6	51.1	50.4	49.6	49.3	49.5
800	47.6	47.2	46.2	46.5	46.6	46.6	46.7	46.1	45.9	44.5	43.8	42.7	42.6	42.8
1000	41.1	40.5	39.5	39.6	39.1	39.6	39.6	35.5	38.5	36.8	35.6	35.4	35.2	35.5
1250														
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	76.7	76.4	76.0	75.7	75.6	75.8	75.7	75.3	75.0	75.3	75.7	75.4	75.1	75.0
(4) A-WTD	64.0	64.0	64.0	63.8	63.5	63.1	62.9	62.9	62.8	62.3	61.6	61.3	61.2	61.2
(5) PNL	75.2	75.3	74.8	74.4	73.9	73.6	73.3	73.2	73.4	73.2	72.4	71.7	71.5	71.4
(6) PNLT	75.7	75.9	76.1	75.3	75.0	74.5	74.2	74.4	74.4	74.2	73.0	71.7	71.5	71.4
(7) ACC RNG	8508	8612	8717	8821	8927	9033	9139	9246	9354	9461	9569	9678	9787	9896
(8) OPT RNG	10553	10693	10833	10973	11114	11256	11398	11540	11683	11826	11969	12112	12256	12400

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 13 TEST DATE 11-08-73 11100408
START TIME 2 43 59.000 REG. N8087U RUN 29 LOC C PAGE 11

(1)

1/3 OCT. CMF (HZ)	62.5	63.0	63.5	64.0	64.5	65.0	65.5	66.0	66.5	67.0	67.5	68.0	68.5	69.0
50	68.6	68.5	67.3	67.3	67.1	67.6	68.4	66.6	66.2	65.5	65.5	65.9	66.8	68.9
63	67.6	69.3	69.4	70.6	70.5	69.3	69.6	68.6	68.9	68.2	68.7	69.4	68.7	68.4
80	66.4	66.2	67.4	67.5	68.1	67.4	66.3	65.4	66.2	66.6	67.6	68.3	68.1	68.4
(2) 100	58.7	58.4	59.9	61.9	62.2	61.7	60.7	60.7	62.6	63.2	63.3	62.8	62.1	62.1
125	61.7	61.4	61.5	59.4	59.1	57.9	58.2	58.0	58.8	58.3	58.1	57.2	57.1	56.9
160	64.9	65.3	64.9	64.5	64.4	63.9	63.7	63.6	63.4	63.5	63.0	62.9	62.4	62.4
200	66.2	65.5	65.3	63.7	65.3	65.2	64.?	64.4	63.9	63.5	63.2	63.1	63.0	62.9
250	63.9	63.6	63.3	63.2	63.1	62.9	62.3	61.7	61.0	61.2	60.8	61.3	61.4	61.8
315		52.8	53.0	53.9	54.2	54.4	53.7	53.4	52.7	52.9	52.7	52.7		
400	57.3	57.0*	56.1	54.3	53.7	53.0	52.9	51.4	51.7	49.6				
500	53.0	53.4	53.0	53.7	53.2	52.6	52.1	51.3	51.2*	51.7*	51.6	51.7	51.0	51.8
630	49.1	48.8	48.0	47.2	46.4	45.6	44.3	42.8	41.9	41.3	41.2	40.6	40.9	41.4
800	43.0	42.5	42.2	41.6	41.4	41.5	40.7	39.4	38.3	38.5	38.8	39.2	39.8	40.5
1000	35.5	35.3	34.6	33.9	33.8	33.3	32.4	31.1	31.0	31.3	31.0			
1250														
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	74.8	75.1	75.0	75.4	75.4	74.8	74.7	73.8	74.0	73.8	74.0	74.4	74.2	74.7
(4) A-WTD	61.0	61.0	60.8	60.5	60.3	60.0	59.5	59.0	58.6	58.5	58.1	58.2	57.8	58.0
(5) PNL	71.3	71.7	71.6	71.5	71.2	70.8	70.4	69.6	69.3	69.0	68.2	68.3	67.4	68.0
(6) PNLT	71.3	72.4	71.6	71.5	71.2	70.8	70.4	69.6	70.5	71.1	68.2	68.3	67.4	68.0
(7) ACC PNC	10006	10116	10226	10337	10448	10559	10670	10782	10894	11007	11119	11232	11345	11458
(8) CPT PNC	12545	12690	12836	12982	13129	13276	13423	13570	13718	13866	14014	14162	14311	14460

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL CC-8-61 FLT 2 MIC 10 TEST DATE 11-08-73 11130408 (1)
START TIME 2 43 59.000 REG. N8087U RUN 29 LOC C PAGE 12

1/3 O.B. CMF (HZ)	69.5	70.0	70.5	71.0	71.5	72.0	72.5	73.0	73.5	74.0	74.5	75.0	75.5	76.0
50	68.5	69.0	67.7	67.1	66.0	65.5	67.3	67.0	67.3	66.4	66.5	66.5	65.5	64.5
63	67.8	68.4	68.8	69.0	69.3	68.4	67.3	66.2	65.7	65.9	66.8	67.7	66.9	66.7
80	68.1	68.6	68.3	68.6	69.6	69.6	68.6	67.2	67.6	68.1	66.6	65.0	64.9	65.3
(2) 100	61.1	61.7	62.1	63.4	64.4	64.8	64.5	64.3	64.4	63.5	62.8	61.3	61.8	64.7
125	56.5	56.5	56.1	57.4	58.3	58.0	57.3	56.2	56.5	57.1	57.2	56.9	56.7	55.8
160	62.4	62.5	61.3	62.0	61.8	62.2	61.7	60.6	59.5	57.6	57.9	57.4	57.2	56.9
200	62.9	62.9	63.4	64.1	64.8	64.6	63.7	62.1	61.1	60.9	61.3	61.7*	61.3	61.1
250	61.8	61.4	61.5	62.1	63.2	63.0	62.1	60.4	59.1	59.6	60.1	59.5	58.7	58.7
315	52.8	52.6	52.8	54.2	55.4	56.0	55.6	54.7	53.5				52.8	53.4
400														
500	52.6	53.1	53.1	53.3	53.5	53.1	51.5	50.0	48.7	47.0	45.8	45.4	45.4	45.3
630	42.9	43.1	43.7	44.3	44.8	44.1	42.2	41.2	41.1	43.8	40.6	39.9	39.9	38.8
800	41.4	41.5	41.8	42.1	42.0	41.1	38.3	36.6	34.5	34.3				
1000														
1250														
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	74.3	74.7	74.5	74.7	75.1	74.8	74.4	73.4	73.3	73.1	72.9	72.8	72.2	72.3
(4) A-WTD	58.4	58.4	58.5	59.1	59.7	59.6	58.7	57.4	56.5	55.8	55.9	55.6	55.6	55.8
(5) PNL	68.6	68.6	68.8	69.5	70.2	70.0	68.8	67.3	66.5	65.4	65.7	65.1	65.5	65.6
(6) PNLT	68.6	68.6	68.8	69.5	70.2	70.0	68.8	67.3	66.5	65.4	65.7	65.7	65.5	65.6
(7) ACC RNG	11572	11686	11799	11913	12027	12141	12255	12370	12485	12600	12715	12831	12947	13063
(8) CPT RNG	14609	14758	14908	15057	15207	15357	15507	15657	15807	15958	16108	16255	16410	16560

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

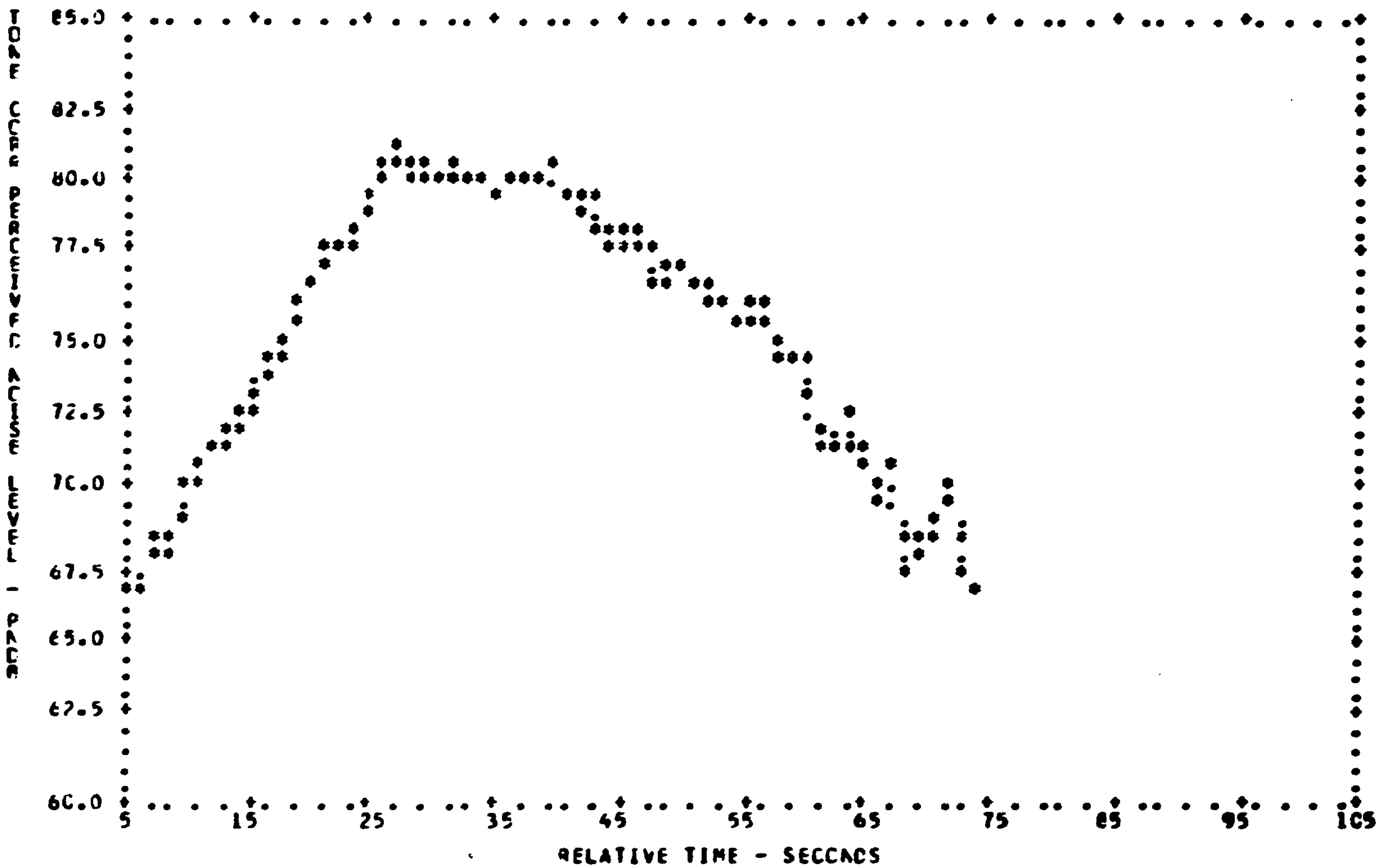
MEASURED SPL HISTORY MODEL CC-8-61 FLT 2 MIC 10 TEST DATE 11-06-73 11100408
START TIME 2 43 59.000 REG. N3087U RUN 29 LOC C PAGE 13

	1/3 O.B. CMF (HZ)	76.5	77.0	77.5	78.0	78.5	79.0
	50	63.2	64.5	64.9	64.8	63.9	62.7
	63	64.8	66.7	66.5	66.7	65.4	65.3
	80	65.1	66.4	66.2	67.5	66.2	66.8
(2)	100	65.1	65.0	62.7	62.7	61.7	61.6
	125	56.2	56.0	56.7	55.5	55.0	54.9
	160	56.7	56.7	56.9	56.9	56.3	54.9
	200	60.5	60.6	60.9	60.7	60.5	59.9*
	250	58.9	58.9	59.0	58.9	58.7	57.7
	315	53.4	54.0	54.0	53.9	53.2	
	400						
	500	45.6	46.0	45.9	45.2	43.2	41.4
	630	39.4	40.0	40.3	41.2	40.1	38.8
	800						
	1000						
	1250						
	1600						
	2000						
	2500						
	3150						
	4000						
	5000						
	6300						
	8000						
	10000						
(3)	OVERALL	71.5	72.5	72.3	72.6	71.6	71.4
(4)	A-WTD	55.6	55.5	55.8	55.8	55.3	54.0
(5)	PNL	64.6	65.4	65.8	65.8	64.8	62.9
(6)	PNLT	64.6	65.4	65.8	65.8	64.8	63.5
(7)	ACC RNG	13179	13295	13411	13528	13644	13761
(8)	OPT RNG	16711	16862	17014	17165	17316	17468

TABLE C-2
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MODEL DC-8-61   REG N8C87U   FLT 2   RUN 29   MIC 1C   LOC C   MEASURED DATA

(9)



ST TIME= 2 43 59.0   TENLTM = 2 44 25.5   OH TIME= 2 44 25.4   11100408

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

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                         FAR PART 36   FLYOVER NOISE LEVELS
                         DATA IDENTIFICATION INFORMATION
DATA DIGITIZED 1-2-74          DATA PROCESSED 04/08/75          1110C408 PAGE 1

                         MODEL DC-8-61   REG. NO. N8087U
                         DC-8-61 FLYOVER NOISE DEFINITION
              MEASURED, REFERENCE-WEATHER AND FAR PART 36 NOISE LEVELS
     ENGINE/NACELLE CONFIGURATION -- P&WA JT3D-3B ENGINES WITH PRODUCTION NACELLES

TYPE OF FLYOVER -- LEVEL FLIGHT                 DATA CLASS -- FN/DLT = 5000    LBS
MEASUREMENT TYPE -- BENEATH FLT PATH, 4   FEET ABOVE SANDY DIRT
RECORDING AT X =  6835.0, Y =  221.0, Z = -2.0 FEET FROM WEST-MOST END OF RUNWAY
REFERENCE RECORDING LOCATION  X =  7034.0, Y =    .0, Z =   .0 FEET

  MEASUREMENT INFO                          AIRPLANE AND ENGINE DATA                    WEATHER DATA
MIC. NUMBER    3          FUSE. NO. 373       AVG. N1RT =    4784. RPM    AMB. TEMP. = 56.2 F
MIC. LOCATION B           FLIGHT     2        AVG. EPR    = N/A            REL. HUM.  =  47.1 PCT
MIC. ORIENT GRAZING       RUN        33       A/P HEADING =    210. DEG    ABS. HUM.  =   5.4 GM/M3
TEST SITE    YUMA         HEIGHT   = 6166.5 FT  FLAP POS.  =    25.0 DEG   WIND SPEED =    5. KN
TEST DATE    11-08-73     LAT. DEV. = 1017.5 FT PATH ANG.  =      .0 DEG   WIND DIR.  =   40. DEG
TEST NUMBER  10.4.1       SLNT.RNG. = 6249.9 FT PITCH ANG. =     2.5 DEG   STA. PRESS = 29.75 IN HG
J P REEL     44676        PATH SPD. =  180.5 KN GR. WEIGHT = 207600. LB    RT. THETA  = 1.0061
     AIRPLANE SPACE POSITIONING IS RELATIVE TO MIC FOR TIME AT MIC OF   3-29-26.8
              OTHER PERFORMANCE DATA IS FOR TIME OF PNLTM OF   3-29-26.0
     TIME OF AIRCRAFT AT MINIMUM DISTANCE FROM MICROPHONE LOCATION    3-29-17.9

     REFERENCE SURFACE WEATHER CONDITIONS   TEMP = 77.0 F & REL. HUM. = 70.0 PCT

                    DESCRIPTION OF ACOUSTICAL DATA PROCESSING

ANALYZER TYPE / RESOLUTION  GR1921(CISA) / 0.25 DB     ATMOSPHERIC ATTENUATION  SAE ARP866(REV)
CISA MODE  1  PASS WITH AUTO-START                     BASIC UNIT   SOUND PRESSURE LEVEL
SAMPLE INTERVAL FOR BASIC DATA =  .500 SECONDS                      (DB REL. 0.0002 MICROBAR)
AVERAGING TIME = 1.500 SECONDS                         DATA TYPES   1/3 OCTAVE, OVERALL, A-WTD,
                                                                     PNL, PNLT & EPNL
```

RUN 33B

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL CC-8-61 FLT 2 (1) MIC 3 TEST DATE 11-08-73 11100408

START TIME 3 28 56.503 REG. N8C87U RUN 33 LOC 8 PAGE 2

1/3 O.B. CMF (HZ)	AMB SPL	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
50	50.5													
63	50.5													
80	48.0													
(2)—100	50.1													
125	54.3													
160	50.5													
200	51.5													
250	47.1				52.0	52.9	53.3	52.6	53.2	53.6	55.0	55.0	55.5	54.8
315	46.6													
400	43.8													47.8
500	36.2	44.7	46.4	47.1	47.8	47.8	47.8	47.6	47.5	47.7	48.1	49.8	50.2	50.8
630	35.1	42.2	43.3	43.3	43.1	41.9	41.2	40.7	39.8	39.7	35.9	40.1	41.3	42.6
800	32.2	36.7	38.0	38.6	38.7	38.3	37.5	38.0	37.7	38.5	35.4	40.7	41.8	42.8
1000	28.8										33.6	34.9	36.0	36.8
1250	26.0													
1600	[illegible]													
2000	20.9													
2500	18.1													
3150	16.7													
4000	17.1													
5000	17.2													
6300	17.2													
8000	17.5													
10000	18.0													
(3)—OVERALL	60.2	47.0	46.5	49.1	53.9	54.5	54.6	54.1	54.5	54.8	56.1	56.5	56.9	57.2
(4)—A-WTD	47.6	44.6	46.0	46.5	48.4	48.5	48.5	48.2	48.3	48.6	45.6	50.4	51.0	51.8
(5)—PNL	53.2	46.4	48.0	48.7	51.7	52.4	52.6	52.0	51.5	51.9	53.3	55.2	55.7	56.6
(6)—PNLT	53.8	46.4	48.0	48.7	51.7	52.4	52.6	52.0	51.5	51.9	53.3	55.2	55.7	56.6
(7)—OC RNG		11717	11541	11366	11191	11018	10846	10674	10503	10334	10165	9598	9833	9668
(8)—OPT RNG		8999	8877	8755	8635	8515	8396	8279	8162	8047	7533	7820	7708	7598

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 3 TEST DATE 11-08-73 11100408
START TIME 3 28 56.500 REG. N8C87U RUN 33 LOC 8 PAGE 3

1/3 O.B. CNF(HZ)	6.5	7.0	7.5	8.0	8.5	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0
50														
63														
80														
(2)——100														
125														
160			54.7	55.2	55.0	54.7	54.5	55.0	56.0	56.6	56.8	57.1	57.6	58.8
200		55.8	56.0	56.8	57.2	57.4	57.5	57.0	57.4	57.5	57.5	59.2	59.2	60.1
250	55.2	55.4	55.9	56.2	57.7	57.6	57.4	55.1	54.7	55.3	56.1	56.7	55.8	56.7
315												51.2	52.2	53.3
400	48.6	49.3	49.9	50.9	51.7	52.1	52.8	54.0	53.8	53.3	52.6	54.2	54.2	54.4
500	50.1	50.1	49.5	49.1	48.7	48.7	48.8	48.9	49.0	48.6	48.6	50.0	51.1	51.9
630	43.4	44.2	44.6	46.2	47.1	47.6	48.0	48.2	48.3	47.7	47.2	48.6	49.8	50.3
800	42.8	42.6	41.6	42.7	43.5	44.1	44.4	44.7	45.1	44.8	44.7	46.1	47.1	47.4
1000	36.8	36.5	37.3	37.7	39.2	39.2	39.0	38.0	38.1	39.1	39.8	41.3	42.0	42.2
1250			29.5	30.1	30.7	30.7	30.4	30.2	30.3	30.5	30.9	32.5	34.1	34.6
1600													27.1	28.7
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	57.5	59.5	61.2	61.8	62.4	62.4	62.5	62.0	[illegible]	62.5	62.7	63.9	64.0	64.7
(4)—A-WTC	51.9	52.9	53.3	53.8	54.5	54.7	54.9	54.7	54.8	54.7	54.7	56.2	56.6	57.1
(5)—PNL	56.9	58.5	59.8	60.3	61.4	61.4	61.4	61.2	61.2	60.5	60.8	63.5	63.7	64.5
(6)—PNLT	56.9	58.5	59.8	60.3	61.4	61.4	61.4	61.2	61.2	60.5	60.8	63.5	63.7	64.5
(7)—ACC PNG	9505	9342	9184	9025	8868	8713	8560	8409	8259	8113	7968	7826	7687	7550
(8)—EPT PNG	7489	7381	7275	7170	7067	6967	6867	6770	6675	6582	6491	6403	6318	6235

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY (1) MODEL DC-8-61 FLT 2 MIC 3 TEST DATE 11-06-73 11100408
START TIME 3 28 56.500 REG. N8087U RUN 33 LOC 8 PAGE 4

1/3 O.B. CMF (HZ)	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	18.5	19.0	19.5	20.0
50														
63														
80														
(2)—100														53.5
125						58.4	59.4	59.2	58.9	58.4	55.9	60.3	61.3	63.3
160	59.0	59.7	59.8	59.9	61.1	62.2	62.3	[illegible]	62.0	63.1	63.3	63.6	63.6	63.9
200	59.7	60.4	60.1	60.6	59.5	59.5	58.8	58.5	59.2	58.7	55.2	59.1	59.6	59.2
250	52.8	52.5	51.8	52.1	51.8	52.0	52.2	52.5	53.1	53.7	54.6	55.7	57.6	58.7
315	53.8	54.9	55.3	57.1	57.5	58.3	58.6	55.3	59.4	59.9	60.2	60.9	61.2	61.1
400	54.0	53.5	53.3	52.8	53.2	53.3	53.4	52.8	51.8	52.1	53.2	55.0	55.5	55.5
500	52.6	53.7	54.5	54.6	54.5	55.0	56.1	56.7	56.5	55.8	55.7	56.3	56.3	56.1
630	49.7	49.0	48.7	45.1	49.8	50.9	51.4	51.4	51.8	52.2	53.2	53.5	53.8	54.0
800	46.7	46.1	46.1	46.2	46.6	47.6	48.5	46.8	49.1	49.5	50.3	50.7	51.2	51.6
1000	41.5	41.0	40.9	41.2	41.2	42.0	43.4	43.8	43.9	43.6	44.5	45.4	46.0	46.5
1250	34.5	34.3	35.1	35.3	36.6	37.7	38.9	39.3	39.3	39.2	39.3	40.0	41.0	41.5
1600	29.4	29.1	29.3	28.9	29.1	29.5	30.5	31.3	31.8	31.8	32.5	33.1	33.8	33.8
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	64.6	65.0	65.0	65.3	65.7	66.8	67.1	67.3	67.1	67.4	68.0	68.4	68.8	68.9
(4)—A-WTC	56.9	57.2	57.3	57.6	57.9	58.5	59.0	59.3	59.3	59.4	59.9	60.5	60.9	61.0
(5)—PNL	64.1	64.6	64.4	64.9	65.0	66.1	66.9	67.3	67.3	67.6	68.1	68.8	69.2	69.3
(6)—PNLT	64.1	64.6	64.4	64.9	65.0	66.1	66.9	67.3	67.3	67.6	68.1	68.8	69.2	69.3
(7)—ACQ RNG	7415	7264	7155	7033	6907	6789	6674	6563	6456	6353	6256	6159	6069	5983
(8)—CPT RNG	6154	6076	6002	5930	5862	5796	5734	5678	5622	5568	5520	5476	5436	5399

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY 3 26 56.500 MODEL DC-8-61 REG. N8087U FLT 2 RUN 33 MIC 3 LOC 8 TEST DATE 11-08-73 11103408 PAGE 5

(1)

STACT TIME	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0
1/3 O.B. CNF(HZ)														
50														
63														
80							53.0	53.0	52.6	51.7	52.0	52.1	52.0	
(2) 100	54.3	55.0	56.4	57.0	58.1	57.8	58.7	56.7	59.4	58.2	57.6	57.8	59.3	60.3
125	61.3	61.5	61.9	61.5	61.9	61.8	61.9	61.8	62.3	63.1	64.4	64.5	63.9	63.6
160	63.6	63.4	62.9	63.8	64.0	64.0	63.2	63.4	63.2	63.5	62.8	63.8	63.6	64.7
200	58.7	57.7	57.4	57.0	57.5	58.1	57.4	57.4	56.5	56.6	56.3	56.5	56.4	58.3
250	59.6	60.3	61.1	61.7	61.7	62.2	62.8*	64.0*	64.5*	64.1*	63.6*	64.3*	64.9*	65.0
315	60.8	60.6	63.0	60.0	59.6	59.6	58.8	58.5	57.9	58.1	58.1	58.7	58.8	58.2
400	55.2	55.5	56.3	56.8	56.9	57.1	57.6	56.3	58.7	58.7	55.0	59.2	60.2	60.2
500	50.1	55.4	55.6	55.3	55.6	55.9	55.2	55.6	55.7	55.9	55.6	55.8	56.3	56.7
630	54.3	54.3	53.6	53.1	52.8	53.7	54.1	54.6	54.8	54.9	55.1	55.4	55.5	55.8
800	51.7	51.5	50.5	50.4	50.6	51.4	51.6	51.6	51.6	51.5	51.4	51.9	51.9	52.5
1000	46.6	46.3	45.6	45.7	44.5	45.2	46.0	46.1	46.5	47.2	48.2	48.3	48.2	48.8
1250	41.6	41.6	41.4	41.7	41.8	42.8	43.9	44.1	43.7	43.3	44.5	45.7	45.5	44.8
1600	33.2	33.7	32.4	32.3	32.4	34.3	35.3	35.4	35.5	35.0	35.5	36.5	36.6	36.1
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	69.1	69.0	69.0	69.4	69.5	69.6	69.6	70.0	70.2	70.2	70.2	70.7	70.9	71.1
(4) A-WTD	61.0	60.9	60.8	60.9	60.4	61.2	61.2	61.1	61.8	61.6	61.6	62.3	62.1	62.8
(5) PNL	69.5	69.4	69.1	69.4	69.5	70.1	70.4	71.2	71.4	71.2	71.0	71.7	72.1	72.3
(6) PNLT	69.5	69.4	69.1	69.4	69.5	70.1	71.2	72.2	72.6	72.4	72.1	72.8	73.3	72.3
(7) ACC RNG	5903	5826	5754	5690	5629	5568	5516	5469	5426	5386	5353	5329	5317	5288
(8) CPT RNG	5362	5338	5322	5302	5766	5376	5430	5456	5060	4938	4981	5138	5313	5337

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL START TIME	HISTORY 3 26 56.500		MODEL DC-8-61 REG. N8287U		(10)	FLT 2 RUN 33		MIC 3 LOC 6		TEST DATE 11-08-73			11100408 PAGE 6	
1/3 O.B. (HF(FT))	27.5	28.0	28.5	29.0	29.5	30.0	30.5	31.0	31.5	32.0	32.5	33.0	33.5	34.0
50														
63														
80	52.2	52.3	53.3	53.1	52.6	53.1	52.4	53.7	52.7	53.1	53.6	53.7	54.8	53.4
100	59.2	58.6	58.7	60.6	61.1	61.5	61.4	60.8	59.7	58.6	56.7	60.4	60.9	60.7
(2)—125	63.4	63.4	63.3	64.7	65.4	65.9	65.9	65.5	65.4	65.0	65.2	63.9	64.5	63.2
160	64.9	65.6	65.0	64.7	64.1	63.8	63.8	65.1	65.5	65.4	64.7	64.9*	64.6*	64.2*
200	58.1	58.8	58.0	56.3	58.3	57.8	57.9	57.5	58.2	58.7	56.6	58.6	58.7	58.8
250	63.7*	63.2*	63.8*	64.4*	64.9*	64.6*	64.1*	63.2*	62.4	62.6	62.1	62.0	61.2	61.0
315	58.4	57.5	58.7	59.0	59.0	59.0	58.8	59.3	59.3	59.6	55.6	55.3	58.7	58.6
400	59.5	59.7	59.8	60.6	60.8	60.7	59.9	59.7	59.7	60.4	60.0	60.1	59.7	55.7
500	57.2	57.9	58.5	58.8	59.1	58.8	57.8	56.5	56.7	56.5	56.6	56.2	56.2	56.5
630	55.5	55.7	55.9	55.4	56.2	55.9	55.7	55.4	55.8	56.1	55.7	55.7	55.6	55.3
800	53.2	54.2	55.0	54.6	54.5	53.4	53.0	51.6	51.0	51.0	51.0	51.5	52.0	51.6
1000	48.4	49.6	50.3	50.1	50.1	49.8	49.6	49.1	48.5	48.4	47.7	47.8	48.7	48.6
1250	43.9	45.4	46.7	46.8	46.6	45.6	45.6	46.0	46.7*	46.0*	46.0*	46.1	46.9	46.6
1600	36.1	37.6	38.4	38.1	36.8	36.1	35.8	35.6	35.2	35.1	34.8	36.3	36.8	36.3
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	70.8	71.0	71.3	71.5	71.8	71.7	71.5	71.4	71.3	71.2	71.0	70.8	70.8	70.4
(4)—A-WTD	62.6	62.8	63.2	63.5	63.7	63.4	62.9	62.5	62.4	62.7	62.4	62.3	62.1	62.0
(5)—PNL	71.6	71.6	72.0	72.5	72.7	72.5	72.1	71.5	71.1	71.5	71.1	71.2	71.0	70.9
(6)—PNLT	72.5	72.4	72.9	73.4	73.8	73.5	73.0	72.3	72.2	72.6	72.2	71.8	71.6	71.4
(7)—SCC RNG	5351	5351	5444	5503	10600	12575	10295	5372	5323	5348	5377	5408	5444	5482
(8)—CPT RNG	5366	5398	5435	5476	5520	5568	5620	5676	5735	5797	5863	5932	6004	6079

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

(1)

MEASURED SPL HISTORY   MODEL CC-8-61   FLT 2   MIC 3   TEST DATE 11-JA-73   11130428
START TIME 3 28 56.500   REG. N8C87U   RUN 33   LOC 8   PAGE 7

1/3 O.B. CNF (HZ)	34.5	35.0	35.5	36.0	36.5	37.0	37.5	38.0	38.5	39.0	39.5	40.0	40.5	41.0
50														
63														
(2)—80	52.7													
100	59.5	58.7	58.7	57.4	56.6	56.7	56.9	57.1	56.4	57.2	57.1	57.1	56.4	55.9
125	63.5	62.9	62.7	62.5	62.2	62.4	62.3	62.3	62.3	61.9	61.4	60.4	60.2	60.6
160	63.8	64.0	63.8	63.4	63.5	64.5	64.9	65.0	63.5	64.1	63.6	63.9	63.1	63.6
200	58.8	57.8	57.3	57.4	59.2	59.6	59.7	55.7	60.2	60.9	60.5	61.6	61.8	62.3
250	60.3	59.2	58.6	58.6	58.0	57.6	56.5	57.5	57.5	57.9	57.6	56.6	55.5	55.5
315	59.7	55.7	60.2	59.5	55.6	59.4	60.0	61.5	61.4	60.9	59.4	59.2	59.2	58.5
400	59.4	59.0	58.8	57.9	57.2	55.8	55.4	55.1	55.0	54.2	54.8	52.1	51.9	52.2
500	56.2	55.7	55.4	55.0	54.6	54.6	54.5	55.2	54.9	54.9	53.9	54.0	53.7	54.0
630	54.5	54.5	54.7	54.6	53.6	53.3	53.0	54.0	54.2	54.3	53.6	52.7	51.9	51.2
800	51.2	50.5	51.7	51.8	51.5	51.1	50.2	50.3	50.2	50.2	45.4	48.8	46.0	47.6
1000	48.6	48.1	48.7	48.7	48.3	47.4	46.2	45.7	47.4	48.1	48.0	46.4	45.3	45.6
1250	45.8	44.4	44.7	44.0	43.5	43.4	42.9	42.6	42.7	42.7	42.2	41.7	41.3	40.0
1600	34.4	33.7	34.8	35.0	34.3	32.1	31.1	30.6	31.3	31.3	31.1	30.3	30.0	30.2
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3)—OVERALL	70.1	69.7	69.6	65.2	69.1	69.3	69.4	65.7	69.4	69.4	68.6	68.8	68.4	68.7
(4)—A-WTD	61.7	61.4	61.4	61.1	60.8	60.5	60.3	60.9	60.8	60.8	60.0	59.7	59.3	59.3
(5)—PNL	70.6	65.8	70.0	69.6	65.4	69.1	69.2	65.5	69.8	69.6	68.6	68.3	68.0	68.2
(6)—PNLT	70.6	69.8	70.0	69.6	69.4	69.1	69.2	69.5	69.8	69.6	68.6	68.3	68.0	68.2
(7)—SCL RNG	5524	5568	5615	5666	5718	5774	5831	5851	5954	6018	6065	6153	6224	6296
(8)—SPT RNG	6157	6238	6322	6409	6498	6589	6682	6777	6875	6975	7077	7180	7285	7392

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL CC-8-61 FLT 2 MIC 3 (1) TEST DATE 11-08-73 111004C8

START TIME 3 28 56.5CC REG. K8C87U RUN 33 LOC 8 PAGE 8

1/3 O.B. GMF (HZ)	41.5	42.0	42.5	43.0	43.5	44.0	44.5	45.0	45.5	46.0	46.5	47.0	47.5	48.0
50		54.5	54.4	54.3		54.3				54.5	54.5	55.5	55.4	56.1
63									55.4	56.4	57.1	55.7	54.8	55.0
80														
100	58.2	55.1	54.7											
125	60.7	60.1	59.8	60.6	60.6	60.0	59.0	58.0	58.6					
160	63.6	63.2	62.9	62.9	63.3	62.5	62.5	62.3	62.5	62.1	61.5	61.6	61.2	61.1
(2) 200	62.2	61.9	62.1	62.3	62.2	61.8	61.7	62.3	62.4	62.3	62.4	62.2	61.5	60.5
250	54.4	54.0	53.5	53.5	52.7	52.3	52.1	52.6	51.5	52.1	53.2	53.4	53.3	52.9
315	58.1	57.6	57.9	58.2	57.9	56.8	56.6	56.0	55.7	54.9	53.6	53.5	52.1	51.5
400	51.8	51.8	51.8	52.2	52.7	52.5	52.6	53.1	53.5	54.5	54.2	54.7	54.7	54.9
500	53.3	53.3	53.1	54.1	54.0	53.7	52.6	52.6	52.3	51.7	51.0	50.8	51.0	50.1
630	50.8	50.2	49.6	45.8	49.6	48.7	48.5	48.5	49.0	48.1	48.1	47.8	48.3	47.8
800	47.5	47.2	46.6	46.7	46.7	46.5	46.4	46.2	46.8	46.6	46.9	47.1	46.9	46.5
1000	45.2	44.5	43.4	43.3	43.3	42.7	42.5	42.0	41.6	40.7	40.9	41.6	41.4	41.1
1250	39.7	39.1	38.9	38.9	38.5	38.0	37.4	36.3	34.5	32.6	33.1	34.4	36.1	36.3
1600	29.9	28.5	27.4											
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	68.5	68.2	68.1	68.2	68.1	67.6	67.2	67.1	67.6	67.1	67.0	66.8	66.5	66.2
(4) A-WTD	58.9	58.5	58.4	58.7	58.7	58.1	57.8	57.8	57.5	57.5	57.3	57.3	57.1	56.7
(5) PNL	68.0	67.6	67.6	67.5	67.3	66.5	66.3	66.5	66.7	65.8	65.8	65.7	65.4	64.6
(6) PNLT	68.0	67.6	67.6	67.5	67.3	66.5	66.3	66.5	66.7	65.8	65.8	65.7	65.4	64.6
(7) ACC RNG	6373	6446	6523	6602	6682	6763	6846	6930	7015	7102	7189	7278	7367	7456
(8) CPT RNG	7501	7611	7722	7835	7949	8065	8181	8258	8417	8536	8656	8778	8900	9023

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY MODEL DC-8-61 FLT 2 MIC 3 TEST DATE 11-08-73 11100406
START TIME 3 28 56.500 REG. N8087U RUN 33 LOC A PAGE 9

(1)

1/3 O.B.	48.5	49.0	49.5	50.0	50.5	51.0	51.5	52.0	52.5	53.0	53.5	54.0	54.5	55.0
CMF(HZ)														
50	55.6	54.4	54.2	54.5	54.2			54.6	54.6	57.[illegible]	56.7	57.3	56.9	56.9
63	55.9	56.0	55.4	54.1	54.7	56.0	56.2	55.2	54.4	57.1	56.6	58.2	56.2	55.4
80	5[illegible].2	53.4	54.5	54.6	54.5	53.4	52.2	52.6	52.9	53.1	53.9	54.1	53.6	53.5
100														
125														
160	61.3	61.2	60.9	60.1	59.4	59.1	59.3	59.3	59.7	58.7	58.7	58.0	57.4	57.0
200	61.7	61.7	62.0	60.5*	60.3*	58.9*	58.7*	58.0*	59.2*	58.8*	59.4*	58.5*	58.2	57.6
(2) 250	54.0	54.3	54.2	54.0	54.0	53.5	52.9	52.9	53.2	52.7	53.3	52.9	52.8	51.5
315	50.7	50.6	50.9											
400	55.2	55.9	56.5	56.1	55.2	54.0	53.9	52.6	52.1	50.9	50.9	50.2	49.7	48.8
500	49.9	50.1	50.1	49.2	48.1	47.1	46.9	46.2	46.2	44.8	44.8	44.4	44.7	45.0
630	46.0	47.6	47.8	47.2	46.5	45.9	45.9	45.9	45.6	45.3	45.2	44.2	43.0*	41.9*
800	46.0*	45.7*	45.7*	44.7	43.7	41.7	40.6	40.1	39.5	39.2	38.7	38.3	37.6	36.8
1000	40.7	40.7	40.0	38.4	37.4	36.5	36.4	35.5	35.0	34.4	34.2	34.5	33.9	33.4
1250	35.4	34.4	33.1	31.9	30.2									
1600														
2000														
2500														
3150														
4000														
5000														
6300														
8000														
10000														
(3) OVERALL	66.7	66.7	66.8	65.9	65.4	64.5	64.4	64.4	64.7	65.0	65.4	65.0	64.3	63.8
(4) A-WTD	56.9	57.1	57.3	56.3	55.6	54.5	54.3	53.8	54.0	53.3	53.5	52.8	52.4	51.7
(5) PNL	65.2	65.2	65.4	63.3	62.6	61.3	61.1	60.5	60.8	60.2	60.6	59.7	59.4	58.7
(6) PNLT	68.2	68.1	68.0	64.9	64.0	62.5	62.5	61.8	62.2	61.6	62.0	60.9	61.1	60.1
(7) ACL RNG	7549	7641	7734	7828	7923	8018	8114	8210	8306	8405	8503	8602	8701	8801
(8) OPT RNG	9147	9272	9397	9523	9650	9776	9906	10035	10164	10294	10425	10556	10687	10819

TABLE C-2

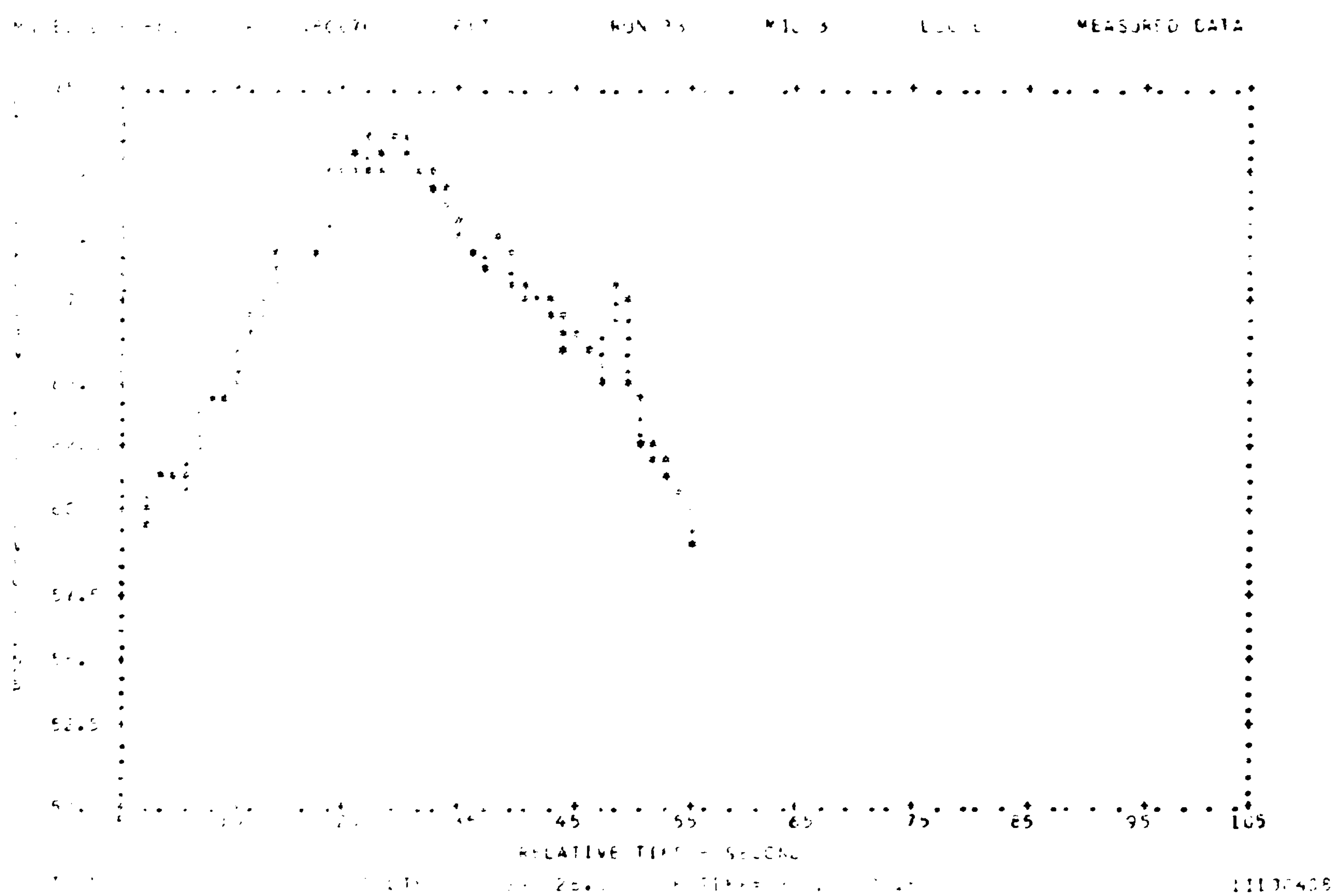
FLYOVER NOISE ANALYSIS SUMMARIES (CONTINUED)

MEASURED SPL HISTORY   MODEL DC-8-61   FLT 2   MIC 3   TEST DATE 11-08-73   11100438
START TIME 3 28 56.500   REG. N8C87U   RUN 33   LOC 8   PAGE 10

	1/3 OCT. CNF (HZ)											
		55.5	56.0	56.5	57.0	57.5	58.0	58.5	59.0	59.5	60.0	60.5
	50	56.9	54.2	54.3	54.7	55.5	55.7	54.1	54.0	54.1	55.5	54.5
	63	56.8	56.8	56.4	57.7	58.3	58.1	56.5	55.1	55.1	54.9	55.3
	80	53.5	54.4	55.1	55.7	55.8	55.4	55.5	55.0	54.9	53.9	54.6
	100											
	125											
	160	56.3	56.5	55.1	54.8		54.2					
(2)	200	56.9*	57.1*	55.8	55.6		55.5	55.2	55.1	54.9	54.8	
	250	52.0	52.7	52.3	52.0	50.9						
	315											
	400	48.9	48.3									
	500	45.3	44.7	44.5	44.4	44.5	43.8	43.7	43.6	44.2	44.1	44.4
	630	41.3	41.0	40.1	39.5	38.5						
	800	36.7	35.5									
	1000	33.3	33.1	32.9						32.2		
	1250											
	1600											
	2000											
	2500											
	3150											
	4000											
	5000											
	6300											
	8000											
	10000											
(3)	OVERALL	63.6	63.6	62.9	63.3	62.0	63.0	61.5	60.9	60.5	61.0	59.7
(4)	A-WTD	51.5	51.5	49.7	49.5	45.9	47.5	46.2	46.0	46.3	46.0	42.0
(5)	PNL	58.1	58.3	55.9	55.0	49.1	53.3	51.5	51.4	51.3	51.2	44.4
(6)	PNLT	59.1	59.1	55.9	55.0	49.1	53.3	51.5	51.4	51.3	51.2	44.4
(7)	ACC RNG	8901	9002	9103	9205	9307	9409	9512	9616	9719	9823	9928
(8)	ALT RNG	10951	11084	11218	11352	11486	11621	11756	11892	12028	12164	12301

TABLE C-2

FLYOVER NOISE ANALYSIS SUMMARIES (CONCLUDED)



APPENDIX D

GROUND REFLECTION PSEUDOTONES

To obtain "free field" noise spectra from data measured in the presence of a ground plane requires that the measured noise spectra be corrected for the spectral effects of the ground reflection phenomena. In the presence of a surface, the recorded noise spectra of a source will be affected by the interferences between the direct and reflected sound waves; with destructive interference or reinforcement of the signal dependent on the differences in in direct and reflected sound path distances.

The theoretical bases for the following are taken from the analyses made by various authors (References 7, 8, and 9).

During a flyover, the geometry of the point source and microphone receiver relative to the ground surface is as shown in Figure D-1.

The source of the sound is assumed to be a point source which produces a stationary and random noise.

In the vicinity of the microphone ground surface irregularities are assumed to be small when compared with the wave length of the sound in the frequency range of interest, such that specular reflection can be assumed and that the concept of an image source can be adopted.

If the ground is considered as a perfect reflector, the ratio, R, of the resulting mean square pressure to the mean square pressure which would have been measured in the "free field" is given by (References 7 and 9):

$$R = 1 + \frac{1}{Z^2} + \frac{2}{Z} C_\tau$$

where

$$Z = \frac{r'}{r}$$

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In the case of a pure tone, the autocorrelation coefficient, C_T, is given by:

$$C_T = \cos 2\pi \frac{\Delta r}{\lambda}.$$

The reflection index, ΔN, associated with this frequency, expressed in dB, represents the difference between the total sound level (direct plus reflected) and the direct signal along. It may be expressed as

$$\Delta N = 10 \log_{10} \left[1 + \frac{1}{Z^2} + \frac{2}{Z} \cos 2\pi \frac{\Delta r}{\lambda}\right]$$

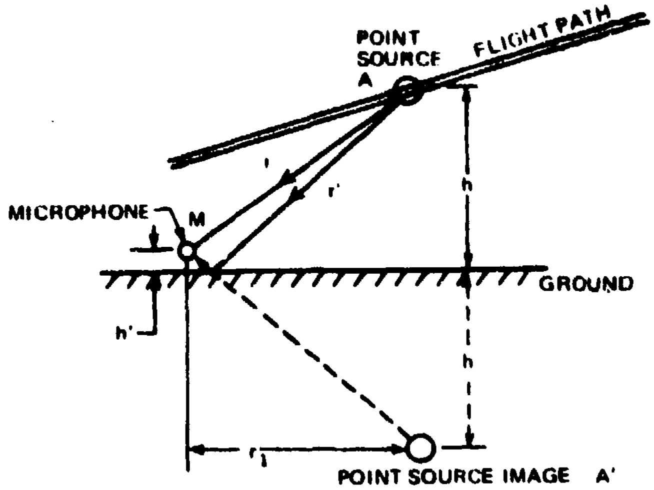
A plot of reflection indices as a function of $\Delta r/\lambda$ for the geometrical parameter $Z = r'/r = 1$ are shown in Figure D-2. A phase difference occurs between the direct and reflected waves because of differences in acoustic path length.

The resulting 1/3-octave band spectrum will contain a series of peaks and nulls with the theoretical form as shown in Figure D-2. The peaks occurring at wave lengths, λ, that are multiples of the sound path differences and the nulls at one-half wave lengths. The first null would occur for the case of the aircraft directly overhead at

$$\frac{\lambda}{2} = 2h'$$

Figure D-3 represents 1/3-octave band spectra plots for a typical test run for microphones located both 4 feet above the ground and flush with the surface. The spectra for the flush microphone was normalized -3 dB to account for pressure doubling. The noise spectra measured with the microphone 4 feet above the ground exhibits nulls and peaks corresponding to the theoretical curve in Figure D-2. Since these nulls and peaks are not associated with the noise source, they are classified as pseudotones.

The flyover-noise analysis computer program (E2QH) provides as an output the designated, by frequency and amplitude, tone corrections that were determined by the procedures specified in Appendix B of FAR, Part 36. However, pseudotones are not associated with the noise source and must



r LENGTH OF DIRECT SOUND RAY
r' LENGTH OF REFLECTED SOUND RAY (LENGTH MA')
r_1 PROJECTION OF DIRECT RAY ON GROUND
h HEIGHT OF SOURCE ABOVE GROUND
h' HEIGHT OF MICROPHONE ABOVE GROUND
$\Delta r = r' - r$ DIFFERENCE BETWEEN REFLECTED AND DIRECT ACOUSTIC PATHS

FIGURE D-1. GEOMETRY OF POINT SOURCE AND MICROPHONE RECEIVER WITH RESPECT TO GROUND SURFACE

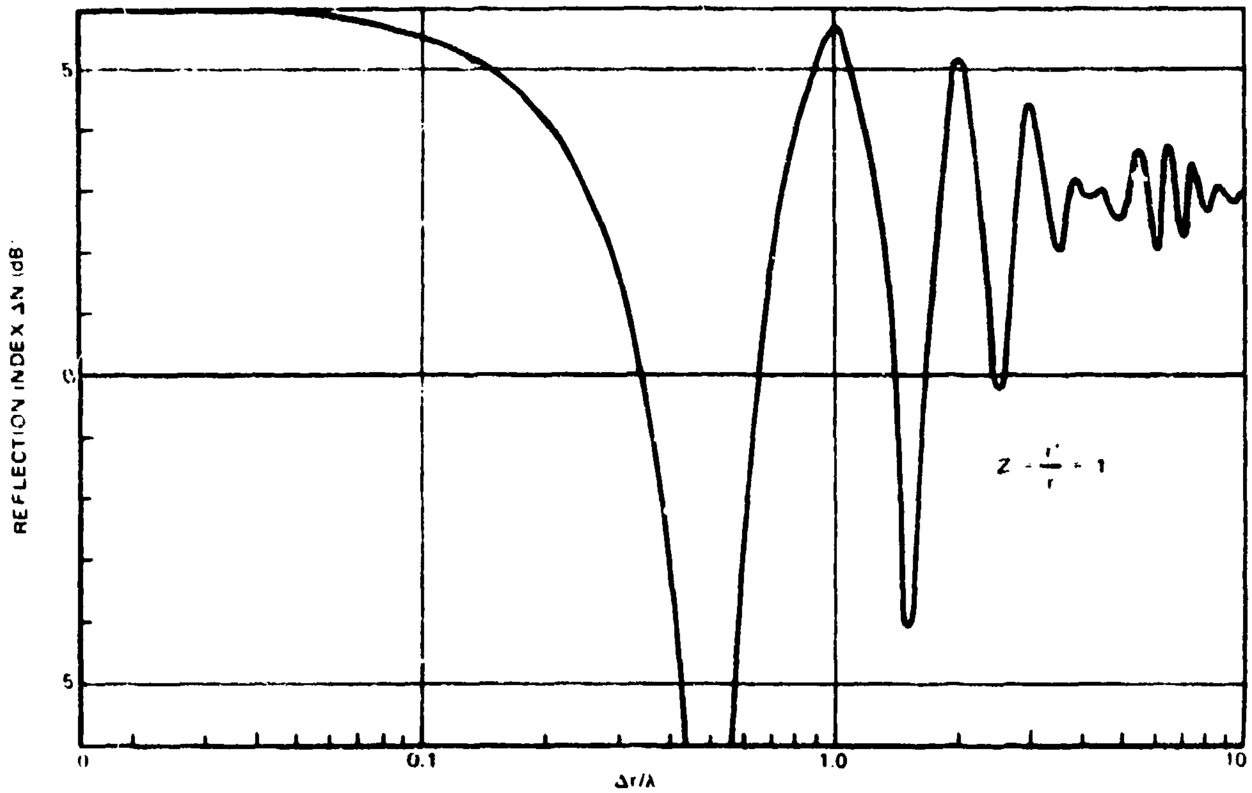


FIGURE D-2. THEORETICAL 1/3 OCTAVE REFLECTION INDEX

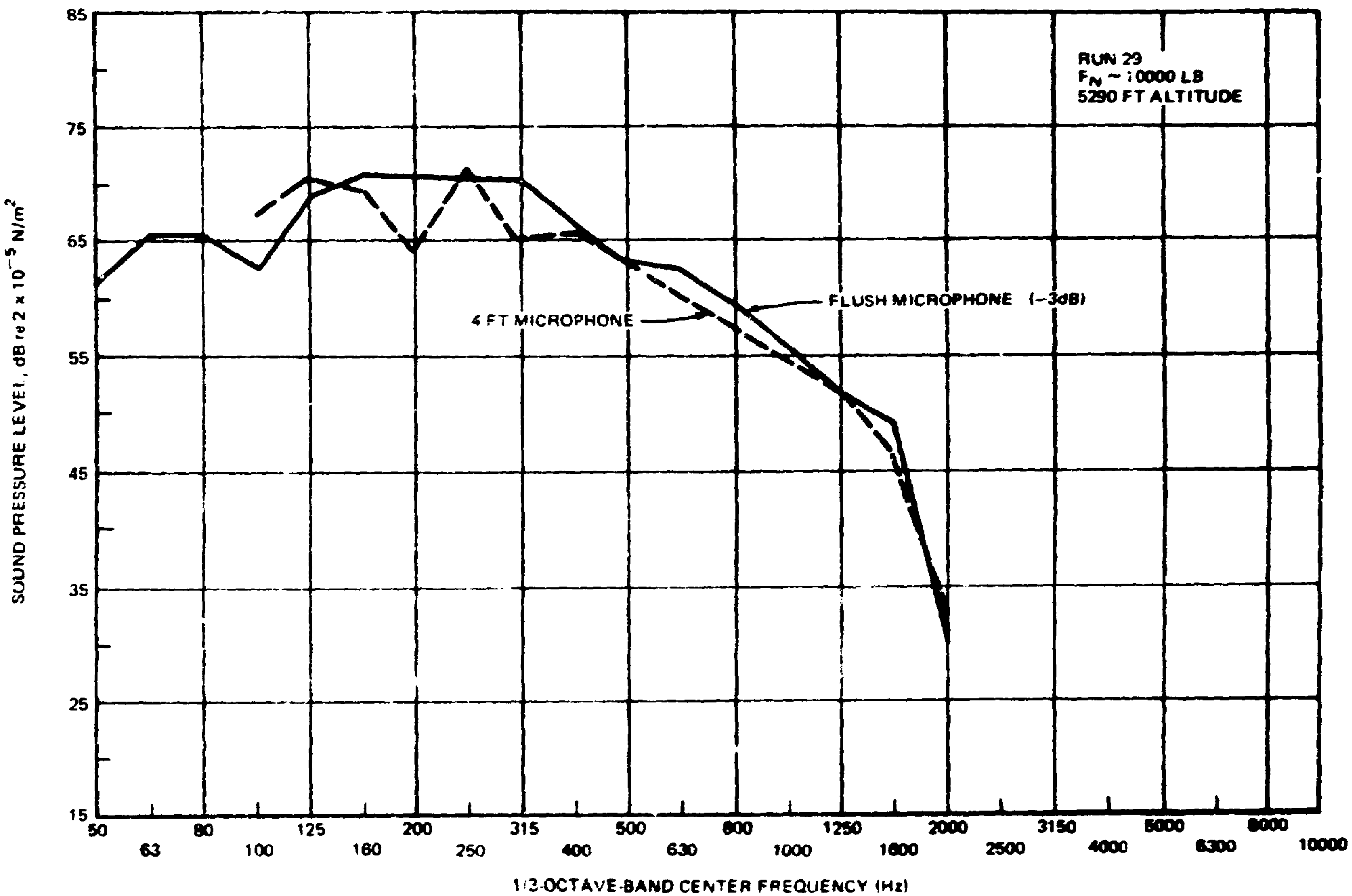


FIGURE D-3. VALIDATION OF PSEUDOTONES

not be applied to the PNL values to obtain PNLT. Table D-1 is a summary of those tone corrections that are considered as pseudotones. Such tone corrections were subsequently removed from the PNLT values shown in Table C-2 of Appendix C.

TABLE D-1
SUMMARY OF PSEUDOTONE ADJUSTMENTS

MEASUREMENT (RUN AND MICROPHONE)	TONE CORRECTION	
	AMPLITUDE – PNLdB	FREQUENCY – Hz
11B	0.5	250
11C	0.9	250
11D	0.9	250
11E	1.6	500
11F	1.7	500
11H	1.0	500
12G	1.2	1000
13G	1.3	1000
15G	1.8	1000
15H	1.1	1250
16F	2.4	500
17E	3.4	500
17F	3.0	500
[illegible]	2.2	500
18F	4.4	500
18F	3.8	500
19F	2.9	500
19G	1.4	500
20F	3.5	500
21E	2.8	500
21F	3.0	500
21G	2.9	500
21H	2.0	500
22C	1.0	250
22D	0.9	315
22F	2.1	800
[illegible]	1.1	1250
23C	0.8	250
23D	0.7	160
23E	2.1	630
23F	1.9	630
23G	1.8	1000
23H	1.0	630
24A	0.5	160
24B	0.7	160
25C	1.1	250
25D	1.1	250
25E	1.1	630
25F	0.7	315
25G	2.0	630
25H	0.7	125

TABLE D-1

SUMMARY OF PSEUDOTONE ADJUSTMENTS (CONTINUED)

MEASUREMENT (RUN AND MICROPHONE)	TONE CORRECTION	
	AMPLITUDE – PNLdB	FREQUENCY – Hz
26A	0.8	250
26F	2.1	800
26H	1.1	1000
27G	2.9	630
27H	0.5	400
28A	0.9	250
28B	0.7	250
28D	0.8	200
28E	0.8	250
28F	0.7	315
28G	1.5	500
28H	1.6	630
29B	0.7	160
29C	1.2	250
29D	1.1	250
29E	1.3	1600
29G	2.5	1250
29F	1.9	630
30C	1.0	250
30D	1.0	250
30E	1.2	1600
30G	0.6	400
31C	1.0	250
31D	0.7	125
32A	0.8	315
32C	1.1	250
32F	1.0	250
32H	0.7	160
33B	1.1	250
33C	1.3	250
33D	1.1	250
33E	1.2	250
33F	1.1	160
33H	1.1	630
34B	0.9	250
34C	1.1	250
34D	1.4	250
34E	0.6	250
34G	0.9	400
34H	1.0	630
35E	1.8	1000

NOTES

(1) DETERMINED BY PROCEDURES SPECIFIED IN APPENDIX B, OF FAR, PART 36.

(2) ALL FREQUENCIES REPRESENT THE CENTER FREQUENCY OF THE 1/3-OCTAVE BAND IN WHICH THE TONE OCCURRED.

APPENDIX E
SUMMARY OF DATA ANALYSIS

The data resulting from the processing and analysis of the flyover-noise measurements are summarized in Table E-1. For the microphone locations not listed, data analyses were not performed because of unacceptable recorded noise or aircraft operational performance measurements. This included all of the first night's data (Runs 1-10).

Table E-1 is a listing of the measured data, the applied corrections and adjustments, and the resultant reference-day noise levels for all the analyzed Phase II flyover data.

The columns, as numbered, contain the following information:

1. TARGET THRUST, F_N/δ_{amb}(1000 lb)
2. RUN NUMBER
3. MICROPHONE LOCATION
4. LATERAL DEVIATION, FT - Distance perpendicular to and measured from the ground projection of the flight path to the microphone location.
5. AIRCRAFT HEIGHT, FT
6. SLANT RANGE, FT - From measurement location to closest point of aircraft (CPA)
7. MEASURED EPNL - Data analyzed as measured (including only measurement system corrections)
8. REFERENCE WEATHER EPNL - Adjusted to reference-day conditions (77°F and 70-percent relative humidity)
9. TONE CORRECTION (MEASURED) - Determined by FAR, Part 36, Appendix B

10. TONE CORRECTION FREQUENCY - Center frequency of 1/3-octave band containing tone

11. MEASURED EPNL MINUS TONE CORRECTION - EPNL with tone correction removed if due to a pruedotone

12. REF. WEA. EPNL MINUS TONE CORRECTION - EPNL with tone correction removed if due to a pseudotone

13. MEASURED dBA - A-weighted sound level including only measurement system corrections

14. REFERENCE WEATHER, dBA - Measured dBA adjusted to reference-day conditions (77°F and 70-percent relative humidity)

15. TRUE AIRSPEED, KNOTS - Measured airspeed

16. ACTUAL THRUST, F_N/δ_{amb} lb

17. AIRSPEED CORRECTION (EPNdB) - EPNL adjustment to reference airspeed

18. THRUST CORRECTION (EPNdB) - EPNL adjustment to target thrust

19. EPNL (ADJUSTED) - (8) or (12) + (17) and (18)

20. THRUST CORRECTION (dBA) - A-weighted sound level adjustment to target thrust

21. dBA (ADJUSTED) - (14) + (20)

22. PNLTM (MEASURED)

23. DURATION CORRECTION (MEASURED) - (22) - (7)

TABLE E-1
SUMMARY OF FLYOVER NOISE ANALYSIS

(1) Target Thrust Fn/δ (1000 lb)	Run Number	(2) Microphone Location	(3) Lateral Deviation ft	(4) Aircraft Height ft	(5) Slant Range ft	(6) Measured EPNL	(7) Reference Weather EPNL	(8) Tone Correction (Measured)	(9) Tone Correction Frequency	(10) Measured EPNL Minus Tone Corr.	(11) Ref. Wea. EPNL Minus Tone Corr.	(12) Measured dBA	(13) Reference Weather dBA	(14) True Airspeed Knots	(15) Actual Thrust Fn/δ	(16) Airspeed Corr (EPNdB)	(17) Thrust Corr (EPNdB)	(18) Ref Weather EPNL (Adjusted)	(19) Thrust Correction (dBA)	(20) Ref Weather dBA (Adjusted)	(21) PNLTM (Measured)	(22) Duration Corr (Measured)
	11	A	33	493	494	115.2	115.6	1.3	3150	—	—	106.7	106.7	168.8	14205	-.3	+.2	115.5	+.3	107.0	120.2	-5.6
	11	B	59	1137	1140	109.8	109.9	.5	250	109.3	109.4	100.2	100.0	166.2	14251	-.3	+.2	109.3	+.8	100.8	111.5	-1.7
	11	C	-42	1642	1642	106.5	106.3	.9	250	105.6	105.4	95.1	94.8	171.6	14330	-.2	+.3	105.5	+.7	95.5	106.5	[illegible]
	11	D	94	2144	2147	104.1	103.8	.7	250	103.2	102.9	91.2	90.8	174.4	14258	-.1	+.5	103.3	+1.0	91.5	102.6	1.5
	11	E	-2446	1197	2724	100.3	100.0	.6	500	98.7	98.4	100.0	87.4	167.4	1425[illegible]	-.3	.2	98.3	.7	88.1	99.7	0.6
	11	F	2554	1108	2817	100.0	99.6	1.7	500	98.3	97.9	99.6	87.0	167.8	14251	-.3	.2	97.8	.7	87.7	99.3	0.8
	11	G	5065	976	5158	88.6	87.5	1.1	—	—	—	81.8	74.2	170.0	14251	-.3	+.2	87.7	+.7	74.9	85.6	3.0
	11	H	7857	789	7897	79.6	78.[illegible]	0	500	78.6	77.7	76.7	64.3	171.0	14205	-.2	+.2	77.7	+.7	65.0	75.9	3.7
	22	B	20	453	453	116.8	117.8	2.1	4000	—	—	108.8	108.6	174.7	3985	-.1	+.2	117.9	+.4	109.0	124.1	-6.1
	22	C	-2	1065	1065	109.1	109.3	1.0	250	108.1	108.3	109.3	98.4	173.5	14079	-.2	+.3	108.4	+.8	99.2	111.1	-5.8
	22	D	—	1854	—	—	—	.9	315	—	—	—	—	176	14147	-.1	+.5	—	+1.0	—	—	6.4
	22	E	-2510	496	2559	96.6	96.5	1.1	3150	—	—	85.4	85.0	174.6	13785	-.1	+.2	96.6	+.4	85.4	97.0	-0.4
	22	F	2490	487	2537	95.6	95.4	2.1	800	93.5	93.3	83.0	82.6	174.4	13984	-.1	+.2	93.4	+.4	83.0	95.0	0.6
	22	G	4963	306	4973	84.6	84.0	1.1	1250	83.5	82.9	73.5	72.6	173.1	13985	-.2	+.2	82.9	+.4	73.0	83.5	1.1
	22	H	1778	145	1779	79.1	79.1	0	—	—	—	68.9	67.9	173.2	14011	-.2	+.2	79.1	+.4	68.3	80.0	0.0
	23	B	36	645	646	113.0	114.0	1.5	3150	—	—	104.5	104.7	169.5	14062	-.3	+.2	113.9	+.5	105.2	117.5	-4.5
	23	C	-84	1326	1329	107.8	107.9	.8	250	107.0	107.1	96.6	96.4	166.6	14169	-.3	+.3	107.1	+.8	97.2	108.2	-4.5
	23	D	-498	2087	2134	103.3	103.4	.7	160	102.6	102.7	90.6	90.3	168.1	14217	-.3	+.6	103.0	+1.0	91.3	102.0	1.3
	23	E	-2463	701	2560	98.4	98.4	2.1	630	96.3	96.3	87.5	87.2	167.9	14062	-.3	+.2	96.2	+.4	87.6	99.6	-.2
	23	F	2538	692	2680	97.2	97.1	1.9	630	95.3	95.2	84.9	84.5	167.7	14062	-.3	+.2	95.1	+.4	84.9	97.1	0.1
	23	G	5029	444	5048	86.4	84.8	1.8	1000	83.6	83.0	70.9	70.1	168.1	14062	-.3	+.2	82.9	+.4	70.5	82.3	3.1
	23	H	7025	222	7028	78.5	N.S.	1.0	630	77.5	77.5	65.6	—	169.1	14194	-.3	+.2	77.4	+.3	—	79.4	3.5
	24	A	-89	1477	1479	105.6	105.7	.5	160	105.1	105.2	94.2	94.0	172.5	14147	-.2	+.3	105.3	+.9	[illegible]	105.5	[illegible]
	24	B	181	2195	2202	103.6	103.5	.7	160	102.9	102.8	91.8	91.5	170.8	14428	-.2	+.4	103.0	+.8	92.3	102.2	1.4
	24	C	-266	2845	2851	101.4	101.1	1.1	250	100.3	100	88.2	87.8	169.9	14370	-.3	+.5	100.2	+1.0	88.8	99.7	1.7
	24	D	-372	3134	3454	99.6	99.2	1.1	250	98.5	98.1	84.8	84.3	171.5	[illegible]	-.2	+.3	98.2	+.7	86.0	96.4	3.3
	24	E	-2687	2250	3504	99.5	99.2	1.1	630	98.4	98.1	85.8	85.3	170.3	14428	-.2	+.5	98.4	+.9	86.2	99.7	2.4
	24	F	2313	2241	3220	100.2	99.9	.7	315	99.5	99.2	87.4	86.9	170.3	14428	-.2	+.5	99.5	+.9	87.0	99.3	1.9
	24	G	4863	2022	5247	92.6	92.0	2.0	630	90.6	90.0	78.1	77.4	170.8	14428	-.2	+.5	90.3	+.9	78.3	85.6	2.4
	24	H	7674	1815	7[illegible]86	85.1	N.S.	.7	125	84.4	84.4	70.2	—	170.9	14147	-.2	+.9	85.1	+1.3	—	95.2	4.3

*TONE CORRECTION REMOVED WHERE DUE TO PSEUDOTONE

TABLE E-1
SUMMARY OF FLYOVER
NOISE ANALYSIS (CONTINUED)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
TARGET THRUST, 10/¢ (1000 LB.)	RUN NUMBER	MICROPHONE LOCATION	LATERAL DEVIATION, FT	AIRCRAFT HEIGHT, FT	SLANT RANGE, FT	MEASURED EPNL	REFERENCE WEATHER EPNL	TONE CORRECTION (MEASURED)	TONE CORRECTION FREQUENCY	MEASURED EPNL MINUS TONE CORR	REF WEA EPNL MINUS TONE CORR	MEASURED dBA	REFERENCE WEATHER dBA	[illegible]	ACTUAL THRUST	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
15,000	25	A	-124	1310	1316	107.0	107.0	.9	250	106.1	106.1	95.5	95.5	167.3	14228	-.3	.3	106.1	4.8	96.3	100.0	—
	25	B	-250	2103	2118	103.4	103.3	.6	315	102.8	102.7	92.3	92.0	166.9	14251	-.3	.5	102.9	1.0	93.0	103.0	2.4
	25	C	-464	2702	2741	102.2	101.9	1.1	250	101.1	102.8	88.6	88.2	169.9	14282	-.3	.6	101.1	+1.1	89.3	100.2	2.6
	25	D	-715	3279	3856	97.6	97.3	.6	315	97.0	96.7	85.1	84.6	171.3	14282	-.2	.5	97.0	.1	85.5	95.9	1.7
	25	E	-2767	2162	3511	99.5	99.2	1.0	630	98.5	98.2	85.6	85.1	164.4	14251	-.3	.6	98.5	1.1	86.2	96.9	2.6
	25	F	2233	2153	3102	100.9	100.6	.5	315	100.4	100.1	88.0	87.5	168.1	14251	-.3	.6	100.4	1.1	88.6	98.3	2.1
	25	G	4806	1923	5176	93.0	92.3	1.7	630	91.3	90.6	79.1	78.3	168.8	14251	-.3	.6	90.9	1.1	79.4	90.8	2.2
	25	H	7667	1680	7849	84.7	83.7	1.1	1000	83.6	82.6	70.1	69.0	169.3	14228	-.3	.6	82.9	1.2	70.2	81.2	3.9
	28	A	408	5335	5358	92.0	N.S.	.7	250	91.1	—	77.4	(77.4)	211.6	13609	.7	1.7	—	3.2	80.6	87.6	4.6
	28	B	600	5410	5443	92.2	91.5	.7	250	91.5	90.8	77.6	76.8	221	13588	.9	1.7	93.4	3.3	80.1	87.0	4.8
	28	C	658	5392	5382	89.4	88.8	0	—	—	—	—	77.0	227.7	13533	1.3	1.8	91.9	3.4	80.4	86.6	2.9
	28	D	724	5452	5499	91.4	—	.8	250	90.6	—	77.2	—	233	13477	1.1	1.8	—	3.5	—	87.7	3.7
	28	E	1896	5604	5727	92.5	91.8	.8	250	91.7	91.1	76.6	75.8	222.2	13588	.9	1.7	93.7	3.2	79.0	87.4	5.2
	28	F	3104	5395	6224	92.1	91.3	.7	315	91.4	90.6	76.5	75.7	220.8	13588	.9	1.7	92.7	3.2	78.9	87.3	4.8
	28	G	558	5381	7753	89.2	N.S.	1.5	500	87.7	—	72.9	(72.9)	224.4	13588	1.0	1.7	—	3.2	76.1	83.9	5.3
	28	H	8362	5365	9935	84.6	N.S.	1.6	630	83.0	—	68.4	(68.4)	224.4	13603	1.0	1.7	—	3.2	71.6	78.5	5.1
12,000	12	A	123	443	460	115.5	116.6	2.7	3150	—	—	104.7	105.6	179.5	9583	-.1	.3	116.8	.5	106.1	123.0	-7.5
	12	B	64	818	821	109.0	110.3	3.0	3150	—	—	96.8	97.7	173.9	9602	-.2	.3	110.4	.3	98.0	114.8	-5.3
	12	C	-62	1129	1130	104.2	105.4	3.3	3150	—	—	91.3	91.6	170.4	9613	-.3	.3	105.5	.4	92.0	107.4	-3.3
	12	D	-268	1426	1454	100.2	100.7	4.1	3150	—	—	88.2	88.3	173.7	9645	-.2	.3	100.8	.3	88.6	100.2	-2.9
	12	E	-2415	839	2508	92.2	92.6	2.4	3150	—	—	80.4	80.1	172.2	9602	-.2	.3	92.7	.3	80.4	92.9	-0.7
	12	F	2595	829	2686	92.7	92.9	4.2	3150	—	—	80.5	80.3	172.2	9602	-.2	.3	93.0	.3	80.6	95.0	-2.3
	12	G	3092	737	3143	79.6	78.9	1.2	1000	78.4	77.7	66.7	65.8	172.7	9602	-.2	.3	77.8	.3	66.1	77.5	2.2
	12	H	7915	630	7940	69.5	68.5	0	—	—	—	58.5	57.3	172.7	9539	-.2	.3	68.6	.4	57.7	66.7	2.8
	13	A	63	469	473	113.8	114.7	2.7	3150	—	—	103.1	104.3	176.9	9364	-.1	.4	115.0	.5	104.8	121.2	-7.4
	13	B	146	878	890	107.8	108.9	3.7	3150	—	—	95.6	96.5	175.0	9475	-.1	.4	109.2	.5	97.0	113.5	-3.6
	13	C	73	1160	1162	103.2	103.7	3.3	3150	—	—	90.8	91.5	172.8	9510	-.2	.4	103.9	.4	91.9	102.0	-3.8
	13	D	-179	1528	1538	99.6	99.7	4.4	3150	—	—	86.9	87.1	178.6	9629	-.2	.3	99.8	.3	87.4	102.3	-2.7
	13	E	-2353	895	2518	93.3	93.5	2.4	3150	—	—	81.3	81.4	176.0	9475	-.1	.4	93.8	.5	81.9	94.3	-1.0

*TONE CORRECTION REMOVED WHERE DUE TO PSEUDOTONE

TABLE E-1

SUMMARY OF FLYOVER NOISE ANALYSIS (CONTINUED)

(1) Target thrust (1000 lb)	(2) Run number	(3) Microphone location	(4) Lateral deviation ft	(5) Aircraft height ft	(6) Slant range ft	(7) Measured EPNL	(8) Reference weather EPNL	(9) Tone correction (measured)	(10) Tone correction frequency	(11) Measured EPNL minus tone corr.	(12) Ref. wea. EPNL minus tone corr.	(13) Measured dBA	(14) Reference weather dBA	(15) True airspeed knots	(16) Actual thrust lb	(17) Airspeed corr (EPNdB)	(18) Thrust corr (EPNdB)	(19) Ref weather EPNL (corrected)	(20) Thrust correction (dBA)	(21) Ref weather dBA (corrected)	(22) PNLTM measured	(23) Duration corr (measured)
10,200	13	F	2647	886	2791	92.1	92.0	4.2	3150	—	—	[illegible]	79.3	134	7475	-.2	.4	92.2	.5	77.8	94.1	-2.[illegible]
	13	G	5141	807	5204	79	78.3	1.3	1000	[illegible]	77.0	75.2	65.[illegible]	174.6	[illegible]	-.1	.4	77.3	.5	65.5	76.5	2.6
	13	H	7918	7.6	[illegible]	[illegible]	68.8	0	—	—	—	68.[illegible]	57.6	176.5	9354	-.1	.5	69.2	.6	58.2	69.0	2.0
	15	A	37	495	497	113.7	114.5	3.[illegible]	3150	—	—	[illegible]	103.8	[illegible]	9524	0	.3	114.8	.4	104.2	121.5	-7.7
	15	B	127	934	913	[illegible]	109.2	[illegible]	3150	—	—	95.1	95.7	[illegible]	9561	0	.4	108.6	.4	96.1	113.0	-5.6
	15	C	23	2.3	1214	102.5	[illegible]	3.5	3150	—	—	90.1	90.3	178.3	9528	0	.4	103.6	.4	90.7	106.4	-3.8
	15	D	-284	1614	1629	[illegible]	98.2	4.2	3150	—	—	[illegible]	[illegible]	179.5	9653		.3	99.1	.3	86.6	101.7	-2.9
	15	E	[illegible]	[illegible]	2592	[illegible]	[illegible]	2	3150	—	—	81.6	[illegible]	[illegible]	9561		.4	93.6	.4	81.6	94	-1.0
	15	F	2631	[illegible]	2785	[illegible]	[illegible]	4.1	3150			79.5	[illegible]	179.1	9561	[illegible]	.4	91.9	.4	79.4	92.8	-1.3
	15	G	5106	838	[illegible]	79.1	76.3	[illegible]	1000	77.3	76.5	65.5	[illegible]	[illegible]	9561	0	.4	[illegible]	.4	65.0	76.5	2.6
	15	H	7875	740	[illegible]	69.9	68.8	[illegible]	2500	66.8	[illegible]	58.6	57.4	179.5	9524	0	.4	68.1	.4	57.8	67.7	2.2
	27	B	476	5306	5327	84.6	N.S.	.7	160	[illegible]	—	[illegible]	64.3	189.1	9170	—	1.0	—	1.3	70.6	79.9	4.7
	29	C	[illegible]	5280	5241	85.1	84.4	.2	250	83.9	83.2	70.[illegible]	[illegible]	189.6	9194	.2	1.0	84.4	1.3	70.8	81.1	4.0
	29	D	[illegible]	5264	5272	84.6	83.9	.1	250	83.5	82.8	[illegible]	69.7	190.3	[illegible]	.2	.6	83.6	1.0	70.7	80.9	3.7
	29	E	[illegible]	5308	[illegible]	84.7	84.0	[illegible]	160	83.4	82.7	69.8	[illegible]	189.0	9170	.2	1.0	83.9	1.3	70.3	80.2	4.5
	29	F	2966	5299	[illegible]	83.4	82.6	0	—	—	—	68.9	[illegible]	[illegible]	[illegible]	.2	1.0	83.8	1.3	69.4	78.2	5.1
	29	G	[illegible]	5296	[illegible]	[illegible]	[illegible]	2.5	1250	78.4	77.3	65.7	64.7	[illegible]	[illegible]	.2	1.0	78.5	1.3	66.0	76.4	4.5
	29	H	8353	5296	[illegible]	74.9	73.0	1.9	630	73.0	71.7	61.4	60.1	189.4	9181	.2	1.1	73.0	1.3	61.4	70.4	4.6
	30	A	428	5229	5246	82.9	82.2	0	—	—	—	69.5	68.7	188.3	9259	.2	—	—	—	—	—	—
	30	B	393	5220	5234	83.1	82.4	0	—	—	—	70.4	70.1	189.6	9279	.2	.9	83.5	1.2	71.3	79.6	3.5
	30	C	[illegible]	5226	5235	85.5	84.9	1.0	250	84.5	83.9	70.6	69.9	189.3	9330	.2	.8	84.9	1.1	71.0	80.[illegible]	4.4
	30	D	322	5238	5248	81.8	84.1	1.0	250	[illegible]	83.1	70.4	69.6	189.8	9242	.2	.9	84.2	1.2	70.8	—	3.8
	30	E	2109	5218	5628	84.8	84.1	1.2	1600	83.6	82.9	70.1	[illegible]	189.5	9279	.2	.9	84.0	1.2	70.5	80.3	4.5
	30	F	2239	5299	5757	83.6	N.S.	0	—	—	—	69.1	(69.1)	189.6	9279	.2	.9	—	1.2	72.2	78.3	5.3
	30	G	540	5215	507	81.4	80.4	.6	400	80.8	79.8	65.9	64.9	189.5	9279	.2	.9	80.1	1.2	66.1	76.5	4.9
	30	H	6217	5216	9733	74.5	N.S.	0	—	—	—	62.0	(62.[illegible])	189.6	9254	.2	.9	—	1.2	63.2	69.2	5.3
	3[illegible]	A	383	8406	8415	75.6	N.S.	0	—	—	—	61.5	—	182.1	9599	.1	.5			—	70.0	5.7
	3[illegible]	B	427	8406	[illegible]	[illegible]	[illegible]	[illegible]	—	—	—	63.6	62.6	181.6	9508	0	.6	77.6	.8	[illegible]	72.4	5.6
	3[illegible]	C	465	8395	8408	78.0	[illegible]	[illegible]	250	—	76.1	63.3	62.3	181.6	9542	0	.6	77.7	.7	63.0	73.7	4.3

*TONE CORRECTION REMOVED WHERE DUE TO PSEUDOTONE

TABLE E-1

SUMMARY OF FLYOVER NOISE ANALYSIS (CONTINUED)

(1) Target Thrust Fn/δ (1000 LB)	(2) Run Number	(3) Microphone Location	(4) Lateral Deviation, FT	(5) Aircraft Height, FT	(6) Slant Range, FT	(7) Measured EPNL	(8) Reference Weather EPNL	(9) Tone Correction (Measured)*	(10) Tone Correction Frequency	(11) Measured EPNL Minus Tone Corr.	(12) Ref Wea EPNL Minus Tone Corr.	(13) Measured OA	(14) Reference Weather OA	(15) True Airspeed Knots	(16) Actual Thrust Fn/δ LB	(17) Airspeed Corr (EPNdB)	(18) Thrust Corr (EPNdB)	(19) Ref Weather EPNL (Adjusted)	(20) Thrust Correction (OA)	(21) Ref Weather OA (Adjusted)	(22) PNLTM (Measured)	(23) Duration Corr (Measured)
10,000	31	D	507	8396	8411	[illegible]	73.8	.7	125	74.1	73.1	61.9	60.9	182.1	9481	.1	.6	73.8	.8	61.7	71.2	3.5
	31	E	-2070	8405	8651	76.0	75.0	0	—	—	—	[illegible]	60.7	181.6	9509	0	.6	75.6	.8	61.5	[illegible]	5.7
	31	F	2931	8396	8893	[illegible]	74.8	0	—	—	—	62.5	61.4	181.6	9508	0	.6	75.4	.8	62.2	[illegible]	5.0
	31	G	5920	8391	9989	75.4	74.2	0	—	—	—	61.4	59.4	181.9	9508	.1	.6	74.9	.8	60.2	69.5	5.9
	31	H	8209	[illegible]	11738	[illegible]	N.S.	0	—	—	—	58.6	—	182	9599	.1	.5	—	—	—	66.6	6.2
	32	A	-6318	8402	8403	77.4	N.S.	.8	315	76.6		61.8	60.9	182	—	.1	—	—	—	—	71.8	5.6
	32	B	-32	8397	8397	77.2	76.2	0	—	—	—	63.1	62.1	181.9	9388	.1	.7	77.0	1.0	63.1	71.6	5.6
	32	C	-15	8395	8395	[illegible]	77.7	[illegible]	250	77.7	76.7	[illegible]	61.8	181.9	9350	.1	.8	77.6	1.0	62.8	73.5	5.2
	32	D	33	8400	8400	76.7	75.7	[illegible]	175	76.0	75.0	62.4	61.4	92	—	.1	—	—	—	—	71.5	5.2
	32	E	-2529	8396	8769	77.1	76.1	0	—	—	—	[illegible]	60.6	181.9	[illegible]	.1	.7	[illegible]	1.0	61.6	70.3	6.0
	32	F	2471	8387	[illegible]	[illegible]	76.4	1.0	250	—	—	[illegible]	6.3	84.7	9388	.1	.7	77.2	1.0	62.3	71.3	6.1
	32	G	4962	8374	[illegible]	75.6	N.S.	0	—	—	—	60.4	122.0	92	—	.1	—	—	—	—	69.0	6.6
	32	H	7754	8386	[illegible]	[illegible]	77.8	.7	160	—	—	63.3	64.3	82.3	—	.1	—	77.9	—	—	78.3	-.5
5,000	19	A	100	1560	1563	[illegible]	90.5	3.1	2500	—	—	77.9	78.1	183.3	4794	.7	.4	91.6	.3	78.4	93.2	-3.5
	19	B	41	1196	1197	96.8	98.4	3.6	2500	—	—	84.6	85.2	186.7	4714	.8	.5	99.7	.5	85.7	101.8	-5.0
	19	C	8	805	805	102.3	103.2	2.6	2500	—	—	90.5	91.4	186.7	4686	.8	.6	104.6	.5	91.9	109.4	-6.0
	19	D	-127	427	445	107.7	108.5	2.4	2500	—	—	96.9	97.4	189.4	4692	.9	.6	110.0	.6	98.0	113.7	-6.1
	19	E	-2463	[illegible]	2708	84.6	84.4	[illegible]	2500	—	—	[illegible]	70.9	186.7	4714	.8	.5	85.7	.5	71.3	84.0	.7
	19	F	2537	1115	[illegible]	84.4	84.3	[illegible]	500	81.5	81.4	71.6	71.1	186.1	4714	.8	.5	82.7	.5	71.6	84.2	.2
	19	G	5054	1193	5193	70.5	69.5	1.4	500	69.1	68.1	62.6	67.7	185.4	4794	.8	.5	69.4	.5	68.2	71.7	-1.2
	19	H	7866	1318	7976	66.1	83.2	0	—	—	—	59.6	73.3	183.8	—	.8	.4	84.4	.4	72.7	67.1	-1.0
	20	A	98	1604	1607	[illegible]	87.2	0	—	—	—	77.3	77.3	178.1	4724	.6	.5	88.3	.5	72.8	88.1	-1.4
	20	B	-28	1186	1186	96.2	97.0	3.5	2500	—	—	83.8	84.2	184.4	4648	.8	.6	98.4	.6	84.8	100.8	-4.6
	20	C	-71	837	840	102.2	102.9	2.8	2500	—	—	90.0	90.5	184.8	4655	.9	.6	104.3	.6	91.1	108.0	-5.8
	20	D	-182	457	472	106.6	107.5	3.1	2500	—	—	96.0	96.5	186.8	4581	.8	.7	109.0	.7	97.2	113.0	-6.4
	20	E	-2534	1157	2785	83.9	83.6	3.5	2500	—	—	70.2	69.7	184.1	4648	.6	.6	85.0	.6	70.3	83.0	0.9
	20	F	2467	1148	[illegible]	85.1	84.9	3.5	500	81.6	81.4	72.2	71.8	182.7	4648	.7	.6	82.7	.6	72.4	85.3	-0.2
	20	G	5006	1253	[illegible]	71.9	71.0	0	—	—	—	63.2	62.3	183.4	4648	.7	.6	72.3	.6	62.9	71.6	0.3
	20	H	7866	1381	7986	60.8	59.4	0	—	—	—	56.0	54.5	177.6	4724	.6	.5	60.5	.5	55.0	60.3	0.5

*TONE CORRECTION REMOVED WHERE DUE TO PSEUDOTONE

TABLE E-1
SUMMARY OF FLYOVER
NOISE ANALYSIS (CONTINUED)

(1) Target Thrust Fn/δ (1000 lb)	(2) Run Number	(3) Microphone Location	(4) Lateral Deviation, ft	(5) Aircraft Height, ft	(6) Slant Range, ft	(7) Measured EPNL	(8) Reference Weather EPNL	(9) Tone Correction (Measured)	(10) Tone Correction Frequency	(11) Measured EPNL Minus Tone Corr.*	(12) Ref Wea EPNL Minus Tone Corr	(13) Measured dBA	(14) Reference Weather dBA	(15) True Airspeed, Knots	(16) Actual Thrust Fn/δ lb	(17) Airspeed Corr (EPNdB)	(18) Thrust Corr (EPNdB)	(19) Ref Weather EPNL (Adjusted)	(20) Thrust Correction (dBA)	(21) Ref Weather dB (Adjusted)	(22) PNLTM (Measured)	(23) Duration Corr (Measured)
5,000	21	A	91	1643	1646	88.9	89.4	4.2	3150	—	—	77.2	77.2	171.8	5051	.5	-.1	89.8	0	77.2	91.2	-2.3
	21	B	-16	1201	1201	96.3	97.3	3.9	3150	—	—	83.5	84.1	181.6	4975	.7	.2	98.2	.2	84.3	97.6	-3.3
	21	C	-39	840	841	101.6	102.8	3.7	2500	—	—	89.0	89.9	185	4859	.8	.3	103.9	.2	90.1	106.6	-5.0
	21	D	-142	450	472	107.9	108.7	2.2	2500	—	—	77.0	77.6	188.3	4912	.9	.3	109.9	.3	97.9	113.3	-5.5
	21	E	-259	1171	[illegible]	84.7	84.6	2.8	500	81.9	81.8	71.4	70.1	180.7	4905	.7	.2	82.7	.2	71.1	84.9	0.3
	21	F	248	1162	[illegible]	85.7	85.5	3.0	500	82.7	82.5	72.7	72.3	180.8	4905	.7	.2	83.4	.2	72.5	85.6	0.1
	21	G	4995	1273	5155	75.6	74.8	2.9	500	72.7	71.9	61.4	61.5	178.3	4905	.6	.2	72.7	.2	61.7	74.4	1.2
	21	H	7824	1417	7951	62.7	—	2.0	500	60.7	—	55.6	62.4	175.2	4905	.5	.2	—	.2	62.6	61.9	0.9
	26	A	540	2485	2543	83.3	83.4	.8	160	82.5	82.6	72.3	72.1	154.8	5112	0	-.3	82.3	-.2	71.9	82.8	.5
	26	B	845	2460	2601	83.9	84.4	.7	160	83.2	83.7	73.4	73.5	153.9	5074	0	-.2	83.5	-.1	73.4	85.5	-2.7
	26	C	748	2499	2600	85.8	86.3	1.1	250	84.7	85.2	73.8	73.9	152.9	5036	-.1	-.1	85.1	-.1	73.8	87.3	-1.0
	26	D	452	2518	2558	84.5	84.7	1.1	250	83.4	83.6	73.3	73.1	153.5	4986	0	0	83.6	0	73.1	85.0	-0.2
	26	E	-1695	2463	2962	85.5	85.6	1.1	630	84.4	84.5	73.4	73.2	153.5	5014	0	-.1	84.4	-.1	73.1	87.3	-.8
	26	F	3355	2454	4157	81.3	81.2	.7	315	81.6	80.5	67.6	67.1	152.7	5074	-.1	-.1	80.3	-.1	67.0	80.1	.3
	26	G	5798	2444	6292	70.8	N.S.	2.0	630	68.8	—	59.2	59.7	153.6	5074	0	-.1	—	-.1	59.6	67.1	3.6
	26	H	8498	2450	8844	64.0	N.S.	.7	125	63.3	—	53.4	(53.4)	154	5112	0	-.2	—	-.2	53.2	62.6	.4
	27	A	-160	2514	2519	84.2	83.5	3.5	2500	—	—	[illegible]	71.1	154.5	4710	0	.7	84.2	.5	71.6	84.6	-1.0
	27	B	12	2520	2520	85.0	84.8	3.3	2500	—	—	72.8	72.5	155.2	4741	0	.6	85.4	.4	72.9	85.7	-1.0
	27	C	92	2503	2504	85.3	85.2	3.4	2500	—	—	72.0	71.7	155.9	4821	0	.4	85.6	.3	72.0	85.5	-.3
	27	D	183	2520	2506	84.2	N.S.	3.8	2500	—	—	71.9	73.4	156.1	4686	0	.7	—	.5	73.9	85.2	-1.0
	27	E	-2477	2516	3531	82.0	81.7	2.3	2500	—	—	69.7	69.2	155.1	4741	0	.6	82.3	.4	69.6	82.1	.6
	27	F	2523	2507	3557	81.9	81.7	1.9	2500	—	—	69.6	69.0	155.1	4741	0	.6	82.3	.4	69.4	80.5	.9
	27	G	4978	2513	5576	74.4	73.6	2.9	630	71.5	70.7	60.4	59.6	155.1	4741	0	.6	71.3	.4	60.0	70.8	2.9
	27	H	7712	2529	8115	64.0	64.6	.5	400	65.5	64.1	58.4	57.5	155.1	4710	0	.7	64.8	.5	58.0	71.0	2.6
	33	A	470	5227	5248	74.7	N.S.	0	—	—	—	62.6	—	180.1	4931	.7	.2	—	—	—	71.8	2.9
	33	B	410	5235	5252	75.6	74.8	1.1	250	74.5	73.7	63.7	62.7	180.5	5093	.7	-.3	74.1	-.2	62.5	73.8	1.8
	33	C	350	5244	5256	76.4	75.7	1.3	250	75.1	74.4	62.8	62.0	180.2	5091	.7	-.3	74.8	-.2	61.8	73.5	2.9
	33	D	281	5253	5261	75.2	74.4	1.1	250	[illegible]	73.3	62.3	61.6	180.0	5057	.7	-.2	73.8	-.1	61.5	72.9	2.1
	33	E	[illegible]	5201	5623	82.0	74.3	1.2	250	80.8	73.1	63.0	62.0	180.6	5093	.7	-.3	73.5	-.2	61.8	73.2	1.9
	33	F	2879	5198	5942	81.9	73.6	1.1	160	80.8	72.5	62.3	61.4	180.6	5093	.7	.3	73.5	-.2	61.2	72.6	1.8

*TONE CORRECTION REMOVED WHERE DUE TO PSEUDOTONE

TABLE E-1

SUMMARY OF FLYOVER NOISE ANALYSIS (CONTINUED)

(1) Target Thrust FN/δ (1000 lb)	(2) Run Number	(3) Microphone Location	(4) Lateral Deviation ft	(5) Aircraft Height ft	(6) Slant Range ft	(7) Measured EPNL	(8) Reference Weather EPNL	(9) Tone Correction (Measured)	(10) Tone Correction Frequency	(11) Measured EPNL Minus Tone Corr.	(12) Ref Wea EPNL Minus Tone Corr.	(13) Measured dBA	(14) Reference Weather dBA	(15) True Airspeed Knots	(16) Actual Thrust FN/δ lb	(17) Airspeed Corr (EPNdB)	(18) Thrust Corr (EPNdB)	(19) Ref Weather EPNL (Adjusted)	(20) Thrust Correction (dBA)	(21) Ref Weather dBA (Adjusted)	(22) PNLTM (Measured)	(23) Duration Corr (Measured)
[illegible]	33	[illegible]	54.9	5222	[illegible]	[illegible]	69.8	0	—	—	—	59.1	58.[illegible]	180.5	5093	.7	.1	70.6		58.1	67.1	3.9
	33	[illegible]	8242	[illegible]	9755	66	[illegible]	[illegible]	63	650	—	54.6	[illegible]	[illegible]	4934	.7	.2	—	.1	59.7	61.8	4.3
	34	A	152	[illegible]	5202	71.6	[illegible]	0	—	—	—	62.1	61.3	177.5	5040	—	—	—	-.1	61.2	70.9	1.2
	34	B	84	[illegible]	[illegible]	[illegible]	[illegible]	.9	[illegible]	[illegible]	—	62.5	62.0	[illegible]	5081	.6	-.3	—	—	61.9	72.4	3.2
	34	C	-2[illegible]	5214	[illegible]	[illegible]	[illegible]	[illegible]	500	75.4	74.6	[illegible]	[illegible]	176.9	5033	.6	-.1	75.1	0	61.9	73.2	3.3
	34	D	-143	[illegible]	[illegible]	75.[illegible]	[illegible]	.4	[illegible]	74.3	73.7	[illegible]	62.4	176.9	4964	.6	.1	74.4	0	62.4	74.2	1.6
	34	E	246	5206	5144	76.0	[illegible]	.6	[illegible]	75.4	[illegible]	[illegible]	63.1	176.9	5081	.6	-.3	75.4	-.1	63.0	[illegible]	2.0
	34	F	[illegible]	5197	[illegible]	74.[illegible]	[illegible]				—	[illegible]	[illegible]	176.[illegible]	5081	.6	-.3	74.0	-.1	61.5	[illegible]	[illegible]
	34	G	[illegible]	5173	[illegible]	72.[illegible]	70	.9	400	72.[illegible]	[illegible]	59.2	[illegible]	177.1	[illegible]	.6	-.3	76.4	-.1	58.1	68.2	2.9
	[illegible]	[illegible]	7136	[illegible]	[illegible]	[illegible]	—	1.0	630	655	—	55.0	55.[illegible]	177.2	5046	.6	-.1	—	-.1	54.9	62.5	4.0
[illegible]	[illegible]	B	156	1369	[illegible]	[illegible]	[illegible]	0	—	—	—	72.6	[illegible]	170.5	[illegible]	.4	-.1	[illegible]	-.1	77.5	87.0	-2.7
	[illegible]	C	00	956	[illegible]	[illegible]	94.4	3.9	4000	—	—	82.1	82.5	166.4	2054	.3	-.1	99.6	-.1	82.4	98.0	-4.3
	[illegible]	D	-12	[illegible]	[illegible]	[illegible]	[illegible]	2.3	2000	—	—	[illegible]	99.5	166.8	2057	.3	-.1	100.4	-.1	[illegible]	104.5	-4.3
	[illegible]	E	-2347	1333	[illegible]	78.3	[illegible]	0	—	—	—	69.1	[illegible]	170.1	2057	.4	-.1	78.3	-.1	68.5	78.2	
	16	F	[illegible]	1324	[illegible]	[illegible]	[illegible]	[illegible]	500	[illegible]	[illegible]	70.0	69.5	169.8	2057	.4	-.1	76.3	-.1	69.4	81.0	-2.4
	16	G	5188	1446	[illegible]	[illegible]	68.4	0	—	—	—	60.9	59.9	169.6	2057	.4	-.1	[illegible]	-.1	59.8	[illegible]	1.7
	[illegible]	A	[illegible]	[illegible]	1942	81.9	82.2	3.5	2000	—	—	71.0	[illegible]	[illegible]	[illegible]	.5	[illegible]	82.6	[illegible]	70.9	84.6	-2.7
	17	B	21	433	[illegible]	[illegible]	88.6	3.8	4000	—	—	76.2	76.5	[illegible]753	2027	.5	-.1	89.0	[illegible]	76.4	91.1	-3.4
	17	C	106	1025	1030	[illegible]	93.0	3.3	4000	—	—	81.0	81.6	[illegible]	2017	.4	0	93.4	0	81.6	96.7	-4.9
	17	D	-130	[illegible]	535	[illegible]	[illegible]	2.[illegible]	2000	—	—	88.7	89.4	171.4	1939	.4	.1	101.2	.2	89.6	103.9	-4.3
	17	E	-227	[illegible]	2682	[illegible]	78.9	[illegible]	500	75.4	75.5	69.6	68.2	174.4	2027	.5	-.1	75.9	-.1	68.1	81.1	-2.3
	17	F	2708	389	3041	80.1	80.0	3.0	500	77.[illegible]	[illegible]	69.1	68.7	174.2	2027	.5	-.1	77.4	-.1	68.6	80.9	-.9
	17	G	5234	1528	5452	69.8	NS	2.2	500	67.6	—	60.4	(60.4)	174.2	2027	.5	-.1	—	-.1	60.3	72.6	-2.8*
	17	H	8083	1640	8248	59.8	NS	0	—	—	—	[illegible]	[illegible]	174	2023	.5	0	—	-.1	54.9	59.2	.6*
	18	A	[illegible]	1900	[illegible]	[illegible]	81.5	0	—	—	—	71.9	72.1	[illegible]	1912	.6	.3	82.4	.2	72.3	[illegible]	-1.3
	18	B	96	[illegible]	[illegible]	88.[illegible]	89.6	3.3	4000	—	—	77.8	78.4	[illegible]	1883	.6	.2	90.4	.3	78.7	91.8	-3.7
	18	C	[illegible]	954	[illegible]	93.4	94.7	2.9	4000	—	—	82.0	82.8	[illegible]	1931	.4	.1	95.2	.2	83.0	[illegible]	-4.3
	18	D	-115	476	[illegible]	99	100.9	2.3	2000	—	—	89.1	90.0	169.7	1879	.4	.2	101.5	.3	90.3	104.7	-5.0

*TONE CORRECTION REMOVED WHERE DUE TO PSEUDOTONE

TABLE E-1
SUMMARY OF FLYOVER NOISE ANALYSIS (CONCLUDED)

(1) Target thrust F_n/δ (1000 LB)	(2) Run number	(3) Microphone location	(4) Lateral deviation, ft	(5) Aircraft height, ft	(6) Slant range, ft	(7) Measured EPNL	(8) Reference weather EPNL	(9) Tone correction (measured)	(10) Tone correction frequency	(11) Measured EPNL minus tone corr.	(12) Ref wea EPNL minus tone corr.	(13) Measured OAS	(14) Reference weather OAS	(15) True airspeed knots	(16) Actual thrust F_n/δ LB	(17) Airspeed corr (EPNdB)	(18) Thrust corr (EPNdB)	(19) Ref weather EPNL (adjusted)	(20) Thrust correction (dB)	(21) Ref weather OAS (adjusted)	(22) PNLTM (measured)	(23) Duration corr (measured)
2,200	16	E	-24.3	1288	2735	80.4	80.6	4.4	500	76.0	76.0	69.6	68.6	176.7	1883	.6	.2	76.5	.2	61.3	82.7	-2.6
↓	5	G	5134	1395	5321	67.8	67.7	3.5	500	64.0	63.9	60.4	59.3	175.7	1883	.5	.2	64.6	.2	59.5	67.0	.2
	9	H	8004	1551	8153	60.2	N.S	0	—	—	—	55.0	56.[illegible]	[illegible]	1912	.6	.2	—	.2	56.9	[illegible]	-0.6
	11	F	5517	1279	5786	71.7	71.1	2.1	500	75.9	76.3	70.0	69.7	176.7	1773	.6	.2	77.1	.2	69.9	82.4	-5.7
3200	37	A	-57	358	363	106.6	107.3	2.6	2500	—	—	96.7	96.3	164.2	3389	.3	-.3	107.3	-.2	96.6	113.4	-6.2
	37	B	52	378	382	107.7	108.6	2.5	2500	—	—	97.2	97.6	159.5	3335	.1	-.2	108.5	-.2	97.4	114.6	-6.3
	37	C	99	307	323	109.9	110.7	2.5	2500	—	—	100.4	100.5	161.[illegible]	3396	.2	-.3	110.6	-.3	100.5	117.2	-7.3
	37	D	-35	340	350	107.1	107.9	2.5	2500	—	—	96.0	97.1	160.[illegible]	3436	.2	-.4	107.7	-.4	96.7	113.9	-6.9
	37	E	-2437	376	2466	78.1	78.8	3.9	2500	—	—	65.3	65.4	161.5	3335	.2	-.2	79.8	-.2	65.2	79.9	-1.8
	37	F	2563	36	2589	76.9	77.3	3.0	2500	—	—	63.9	63.8	61.5	3335	.2	-.2	77.3	-.2	63.6	76.2	.6
	38	B	92	345	358	110.1	107.1	1.7	2500	—	—	96.6	97.7	169.3	2997	.4	+.3	107.8	.3	96.0	111.9	-5.8
	38	C	39	398	400	105.4	106.7	3.0	2500	—	—	95.3	96.3	157.9	3006	.1	.3	107.1	.3	96.6	112.5	-6.5
	38	D	-49	408	412	103.5	109.2	2.7	2500	—	—	93.0	93.8	159.3	3015	.1	.3	104.6	.3	94.1	109.7	-6.2
	38	E	-2414	352	2439	69.2	69.7	1.8	500	67.4	67.9	65.5	53.7	167.3	2997	.3	.3	68.5	.3	54.0	80.2	-2.0
↓	38	F	2586	393	2609	66.9	67.6	0	—	—	—	62.2	62.7	166.0	2997	.3	.3	68.2	.3	63.0	70.0	-3.0
	38	G	5110	309	5119	60.1	58.9	0	—	—	—	59.3	53.7	166.4	2997	.3	.3	59.5	.3	54.0	62.1	-2.0

NOTE:

1. THERE ARE NO EGA OR SHIELDING EFFECTS WITH THE OVERHEAD MICROPHONES (MIC A,B,C,AND D)
2. NS INDICATES "NO SKIRTS" (DATA TO 10-PNdB DOWN POINTS BOTH PRIOR TO AND PAST POINT OF PNLTM)
3. $\Delta EPNL = 10 \log_{10} (W_{TEST}/W_{REF})$

*TONE CORRECTION REMOVED WHERE DUE TO PSEUDOTONE

APPENDIX F
PROCEDURE FOR NOISE CURVE DEVELOPMENT

Determination of a mean curve fit to a set of experimental noise-level data has long been a problem in establishing the relationship between noise level and distance from a source. Numerous techniques, such as least-square curve fit to a polynominal of a desired degree or simple use of a ship's curve, have been used.

In this program, the dependence of noise level on distance from the source is based on a least-square curve fit using an expression accounting for the decrease in noise level with distance according to a logarithmic decay term (spherical divergence attenuation) and a term for atmospheric losses having a linear coefficient (atmospheric attenuation). Thus it can be expressed as

$$L_o - a \log (X/X_o) - b [(X - X_o)/1000] = L,$$

where

L_o = noise level at reference distance, EPNdB or dB

a = coefficient of logarithmic decay term for given noise-level quantity

X = distance between source and receiver, feet

X_o = reference distance of 250 feet

b = coefficient of linear decay term for given noise-level quantity, EPNdB/1000 feet or dB/1000 feet

L = noise level at distance X, EPNdB or dB

(A variable coefficient was included for the logarithmic term because there was not an a' priori reason for the EPNL or the A-weighted level to decay exactly as the inverse-square law. The value of the coefficient should be approximately 20.)

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It is necessary to find L_o, a, and b such that a curve through the data points minimizes the error. There are, in general, N data points, and the form of the equation, for a general data point at X_i, Y_i, becomes

$$L_o - a \log (X_i/X_o) - b [X_i - X_o)/1000] = L_i$$

To simplify,

let $\log (X_i/X_o) = W_o$

and $(X_i - X_o)/1000 = Z_i$

which gives

$$L_o - a W_i - b Z_i = L_i$$

For the DC-8-61 airplane in this study, the coefficients, (L_o, a, and b) were determined by the use of a regression method and the noise level as a function of distance for each power setting generated. Because of insufficient data points in the basic Phase II study, some of the noise curves were in conflict in relation to the noise data for the other power settings. When this happened, curves were readjusted by using (noise versus power setting at a desired altitude) cross plots.

In addition, curve definition outside the measured data points required extrapolation. Such extrapolations are shown as dashed lines in Figures 14 and 15.

APPENDIX G

SOUND PATH EXCESS ATTENUATION BY LAYERED WEATHER METHOD

The determination of the reference-day noise levels presented in this report are the result of atmospheric attenuation adjustments based on ground level measured weather conditions at the time of the specific flyover-noise measurement. Table G-1 contains a summary of the measured and reference-weather PNLT and EPNL values for selected flyover-noise measurements. All data are for locations directly beneath the flight path, thus eliminating any lateral noise attenuation.

The effects that any variations in upper-air weather might have on the determination of reference-day noise levels were investigated. For each of the measurements listed in Table G-1 the sound path was divided into a series of segments or layers. The average weather conditions for each layer were found from the upper-air weather data presented in Figure B-4. By use of a subroutine from the E2QH flyover-noise analysis computer program the ARP 866 atmospheric absorption adjustments for each layer were determined, summed, and then applied to the measured data to obtain PNLT and EPNL (listed in Table G-1), and 1/3-octave-band sound pressure levels (shown in Figure G-1).

Comparisons between the measured data, and the data based on surface weather and the layered weather methods of determining reference-day noise levels are presented in Table G-1 and Figure G-1.

TABLE G-1

SUMMARY OF NOISE LEVELS DETERMINED BY SURFACE-WEATHER AND LAYERED-WEATHER METHODS

	RUN	MIC	TYPE OF FLYOVER	Fn/δ	SLANT RANGE	VTRUE	PNLT MEASURED	PNLT REF WEATHER	PNLT LAYERED	EPNL REF WEATHER	EPNL LAYERED	EPNL LAYERED – EPNL REF WEATHER	UPPER AIR PROFILE (TABLE B4)
TARGET THRUST 15,000 LB	11	A	TAKEOFF	14205	494	168.8	120.2	120.7	121.3	115.6	116.3	+0.7	1
		B	TAKEOFF	14261	1140	166.2	111.5	111.5	112.2	109.8	110.5	+0.7	1
		C	TAKEOFF	14330	1642	171.6	106.5	108.4	107.0	106.4	107.1	+0.7	1
	22	B	TAKEOFF	13985	453	174.7	122.6	123.5	124.2	117.7	118.5	+0.8	2
		C	TAKEOFF	14079	1066	173.5	111.1	111.3	111.8	109.3	109.8	+0.6	2
	23	B	TAKEOFF	14062	646	168.5	117.5	118.7	119.4	114.2	115.0	+0.8	2
		C	TAKEOFF	14169	1329	166.8	108.2	108.4	108.9	108.0	108.5	+0.6	2
	24	A	TAKEOFF	14147	1479	170.5	106.5	106.5	106.0	105.6	106.2	+0.6	2
		B	TAKEOFF	14428	2207	170.8	102.2	102.1	102.7	103.5	104.1	+0.6	2
	25	A	TAKEOFF	14228	1316	167.3	107.4	108.0	108.4	107.4	107.9	+0.5	2
		B	TAKEOFF	14251	2118	166.9	103.0	102.9	103.4	103.3	103.9	+0.6	2
	28	C	LEVEL	13533	5382	227.7	86.6	86.0	86.8	88.8	89.7	+0.9	2
TARGET THRUST 10,000 LB	12	A	TAKEOFF	9533	460	174.5	123.0	124.0	124.2	116.5	116.8	+0.3	1
		B	TAKEOFF	9683	821	173.9	114.2	115.6	116.6	110.4	111.4	+1.0	1
		C	TAKEOFF	9613	1130	170.0	107.4	108.9	110.4	105.7	107.2	+1.5	1
	13	A	TAKEOFF	9354	473	176.9	121.7	122.0	122.5	114.6	115.1	+0.5	1
		B	TAKEOFF	9475	890	175.0	113.5	114.6	116.2	108.9	110.6	+1.7	1
		C	TAKEOFF	9510	1162	172.8	107.0	108.1	110.1	104.3	106.3	+2.0	1
	15	A	TAKEOFF	9524	497	180.5	121.5	122.3	123.0	114.5	115.3	+0.8	3
		B	TAKEOFF	9661	913	179.9	113.0	113.8	115.7	108.3	110.2	+1.9	3
		C	TAKEOFF	9628	1214	178.3	106.4	107.5	109.9	103.6	106.0	+2.4	3
	30	A	LEVEL	9254	5246	188.3	78.3	77.7	78.5	82.3	83.1	+0.8	2
		B	LEVEL	9279	5234	189.6	79.6	79.0	80.1	82.5	83.4	+0.9	2
	32	C	LEVEL	9350	8395	181.9	73.5	72.6	73.3	77.8	78.5	+0.7	4
TARGET THRUST 5,000 LB	19	A	APPROACH	4794	1563	183.3	93.2	94.0	96.5	90.5	93.1	+2.6	3
		B	APPROACH	4714	1147	186.7	101.8	102.8	105.1	97.8	100.1	+2.3	3
		C	APPROACH	4686	805	186.4	108.4	109.1	110.6	103.0	104.6	+1.6	3
	20	A	APPROACH	4724	1607	178.1	88.1	89.2	91.5	87.2	90.1	+2.9	3
		B	APPROACH	4648	1186	184.4	100.8	101.5	103.6	96.9	99.3	+2.4	3
		C	APPROACH	4655	840	184.8	106.0	108.6	110.3	102.8	104.6	+1.8	3
	21	A	APPROACH	5057	1646	171.8	91.2	92.0	94.8	89.7	92.5	+2.8	3
		B	APPROACH	4905	1201	181.6	99.6	101.1	103.5	97.8	100.2	+2.4	3
		C	APPROACH	4859	841	185.0	106.6	107.6	109.0	102.5	104.0	+1.5	3
	26	A	LEVEL	5112	2543	154.8	82.8	83.0	83.9	83.5	84.4	+0.9	2
		C	LEVEL	5036	2600	152.9	86.8	87.3	89.7	86.2	88.7	+2.5	2
	27	A	LEVEL	4710	2519	154.5	84.6	84.4	86.3	83.4	84.3	+0.9	2
		B	LEVEL	4741	2620	156.2	86.0	85.7	87.2	84.7	86.2	+1.5	2
		C	LEVEL	4821	2604	155.9	85.5	85.3	86.2	85.1	86.0	+0.9	2
	33	B	LEVEL	5093	4938	180.5	73.8	72.8	75.4	74.4	77.0	+2.6	4
		C	LEVEL	5091	5256	180.1	73.5	72.9	73.6	75.8	76.6	+0.8	4
	34	C	LEVEL	5033	5214	176.9	73.2	72.6	73.4	75.9	76.7	+0.8	4

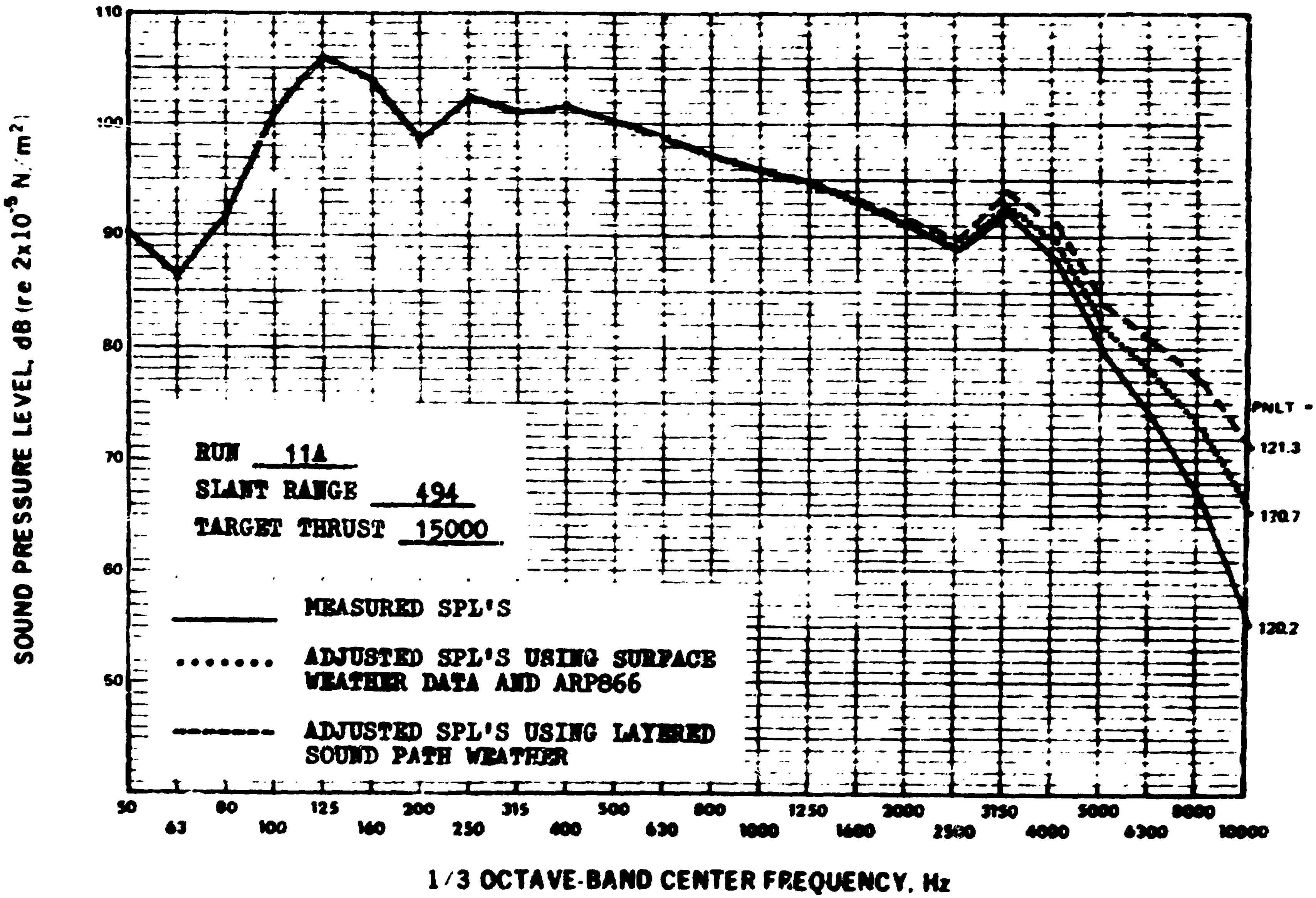

FIGURE G-1. COMPARISON OF METHODS FOR ADJUSTING MEASURED SPLs TO REFERENCE WEATHER CONDITIONS

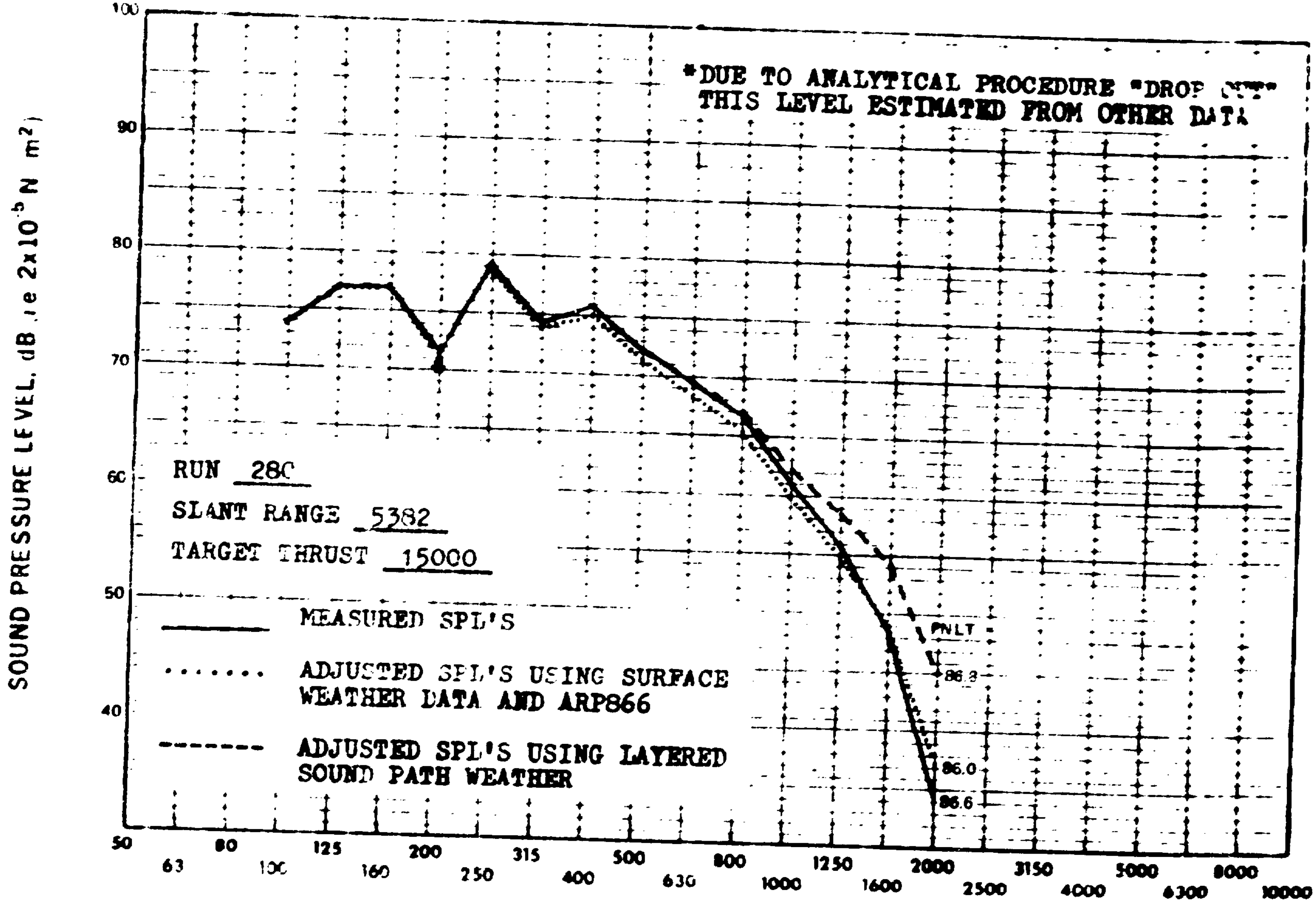

FIGURE 5.1 COMPARISON OF METHODS FOR ADJUSTING MEASURED SPLs TO REFERENCE WEATHER CONDITIONS (CONTINUED)

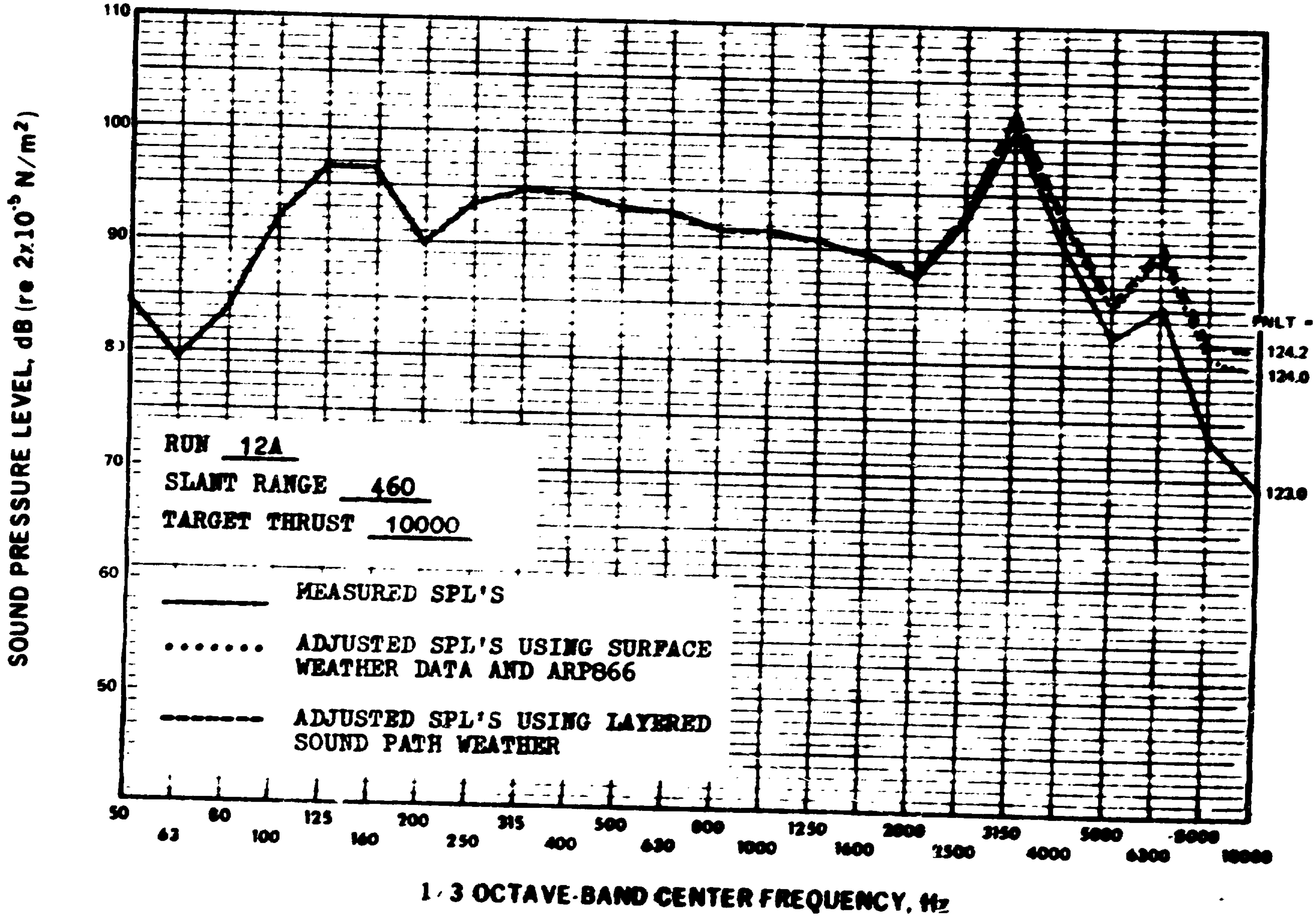

FIGURE G-1. COMPARISON OF METHODS FOR ADJUSTING MEASURED SPLs TO REFERENCE WEATHER CONDITIONS (CONTINUED)

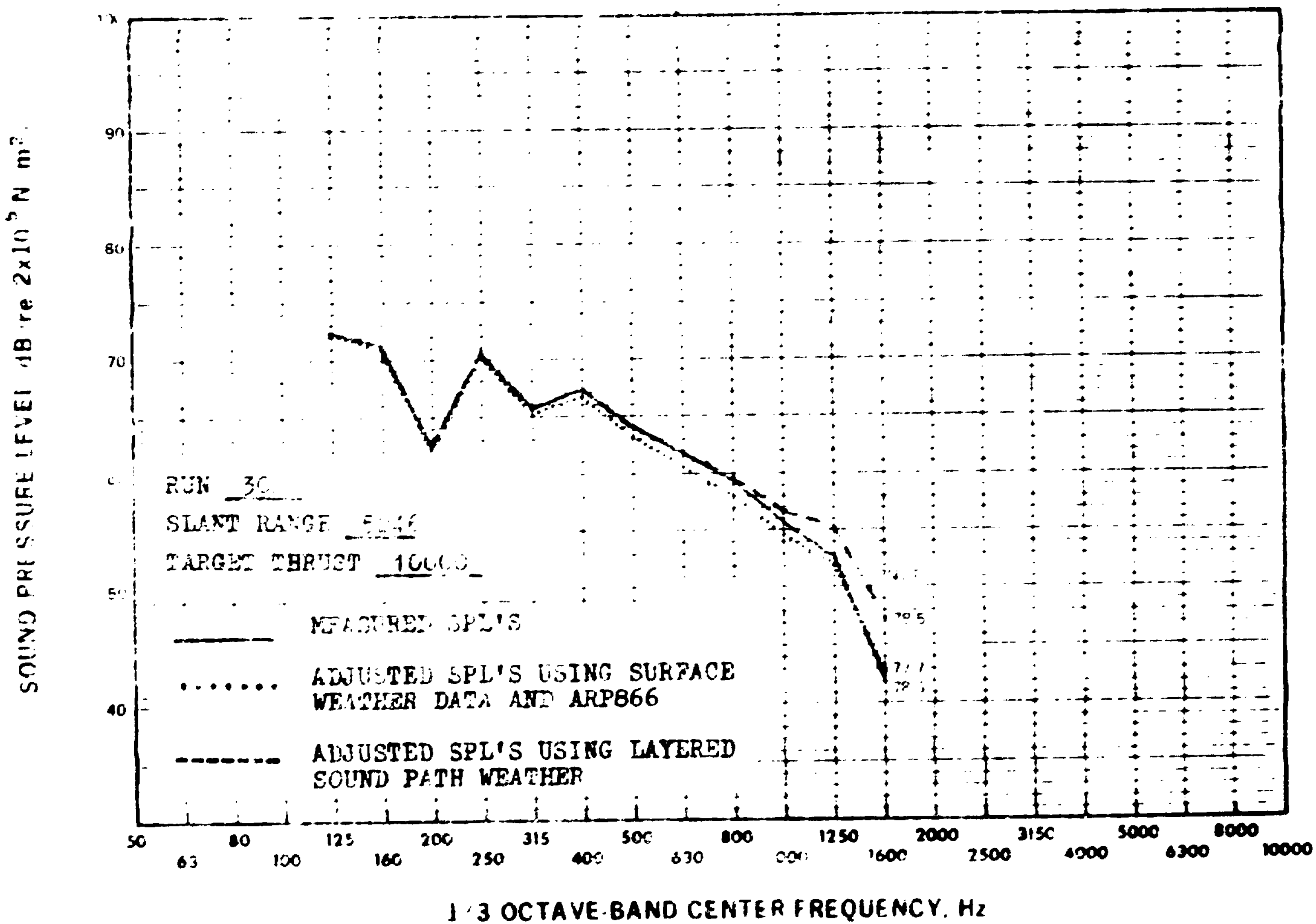

FIGURE G-   COMPARISON OF METHODS FOR ADJUSTING MEASURED SPLs TO REFERENCE WEATHER CONDITIONS (CONTINUED)

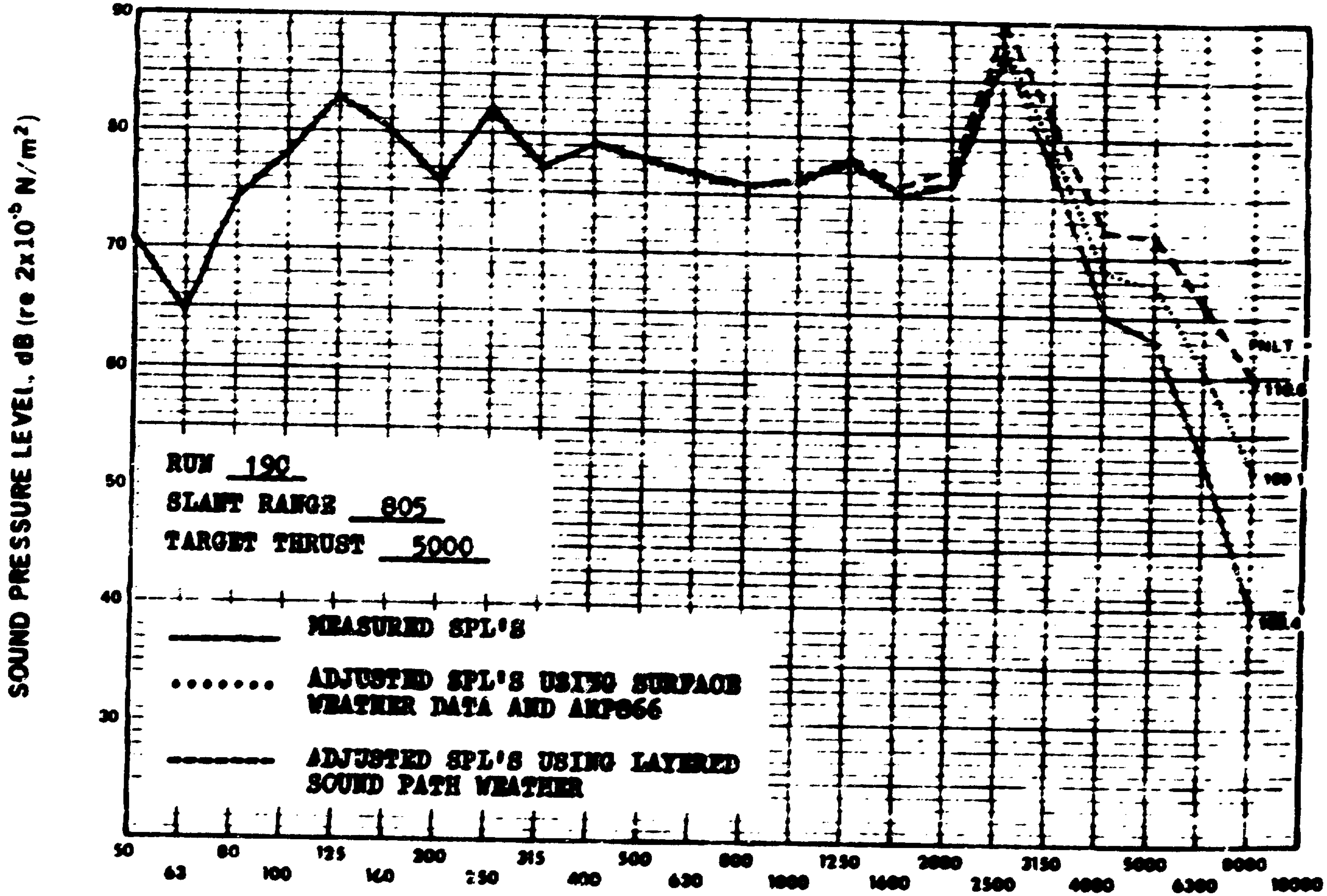

FIGURE G-1. COMPARISON OF METHODS FOR ADJUSTING MEASURED SPLs TO REFERENCE WEATHER CONDITIONS (CONTINUED)

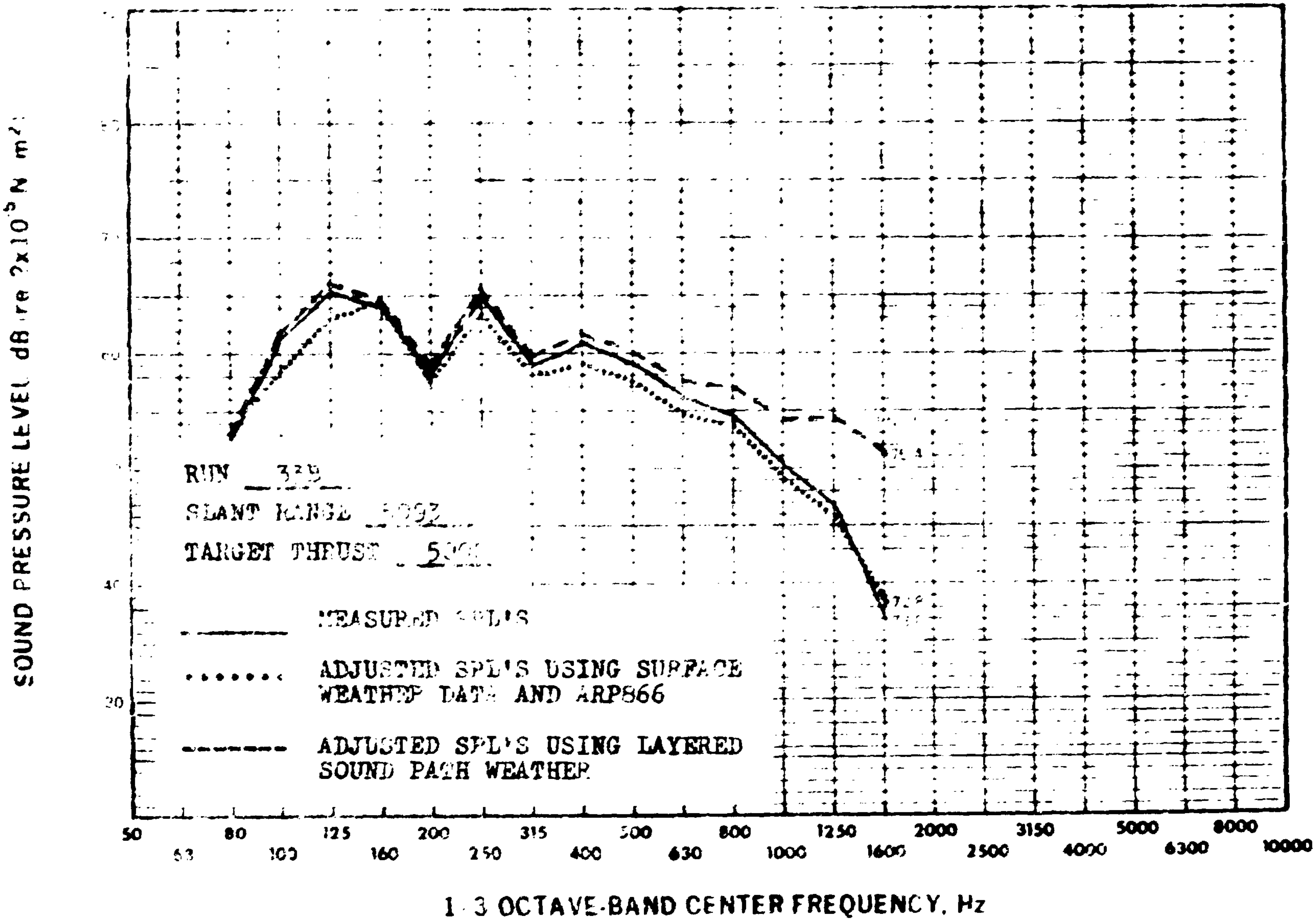

FIGURE . . COMPARISON OF METHODS FOR ADJUSTING MEASURED SPL's TO REFERENCE WEATHER CONDITIONS (CONCLUDED)

APPENDIX H

COMPUTER PROGRAM, D3AA, FOR DETERMINING FLYOVER NOISE LEVELS

This program was developed in compliance with FAA Contract No. DOT-FA73WA-3161.

The purpose of this program is to calculate EPNL and A-weighted sound level values for a specific aircraft at a desired power setting and altitude.

The FAA noise definition digital computer program is written in Fortran IV language for use on a IBM 360/370 computer system

The program has a built-in data bank to define EPNL and A-weighted sound level curves for six aircraft, namely DC-8-61, DC-8-63, DC-9-30 with JT8D-7 engines, DC-9-30 with JT8D-9 engines, DC-10-10, and DC-10-40.

No library routines are required for program operation because of a built-in linear interpolation routine.

The inputs required to calculate EPNL and A-weighted sound levels are: model (see program listing for code numbers), power setting, F_N/δ for DC-8 and DC-9, or $N_1/\sqrt{\theta_{T_2}}$ for DC-10; and altitude in feet. Any number of cases can be input and calculated without a sentinel in the data cards to terminate program execution.

The program will check each data input to verify that the desired power setting and altitude are within the range of the defined curves for the applicable model. If either of the values is outside of the range, a message to that effect will be printed along with the model, engine, and input power setting and altitude.

Output is on a 11 x 17 page but can be modified to any format desired. A sample of the output format is shown on Table H-1 of this appendix. Note that EPNL values are representative of fixed aircraft velocities. Determination of the EPNL for other velocities can be made by the formula 10 log V/V_{REF}.

A flow chart, Figure H-1, input format loading sheet and program listing are attached to this appendix.

The only change to the computer listing, over that provided under Phase I, was the curve slope values for the DC-8-61.

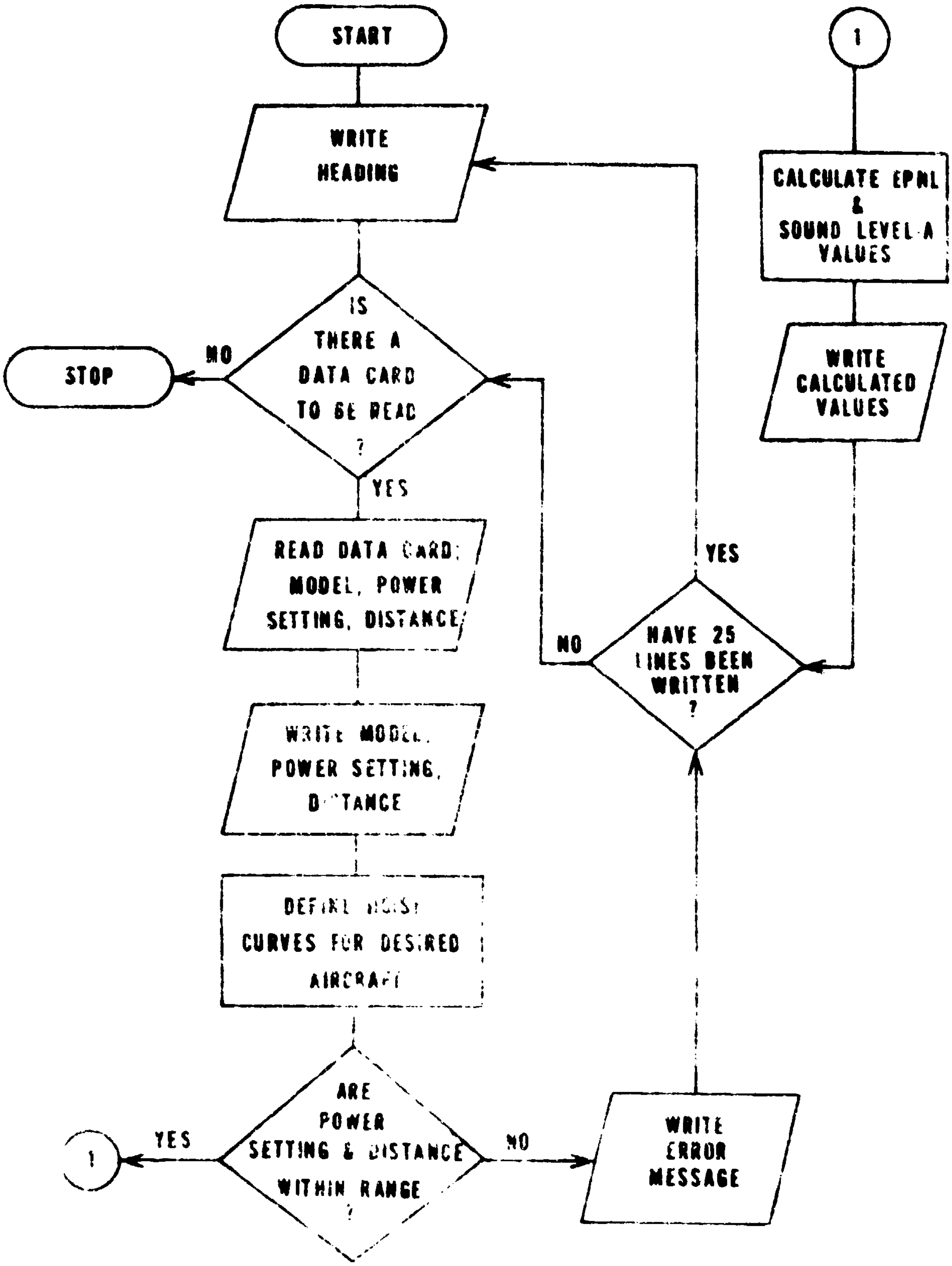

FIGURE H-1 FLOWCHART FOR COMPUTER PROGRAM D3AA

TABLE H-1
SAMPLE OUTPUT FROM D3AA
COMPUTER PROGRAM

MODEL	ENGINE	POWER SETTING	AIRCRAFT ALTITUDE	AIRCRAFT VELOCITY	EPNL, EPNdB	SOUND LEVEL-A
DC-8-61	JT3D-3B	4000.0 LBS	1000.0 FT.	155 KNOTS	96.9	[illegible]
DC-8-61	JT3D-3B	5000.0 LBS	1000.0 FT.	155 KNOTS	99.5	87.2
DC-8-61	JT3D-3B	6000.0 LBS	1000.0 FT.	155 KNOTS	102.7	88.9
DC-8-61	JT3D-3B	8000.0 LBS	1000.0 FT.	180 KNOTS	104.0	91.9
DC-8-61	JT3D-3B	10000.0 LBS	1000.0 FT.	180 KNOTS	106.2	94.5
DC-8-61	JT3D-3B	12000.0 LBS	1000.0 FT.	180 KNOTS	107.9	96.9
DC-8-61	JT3D-3B	15000.0 LBS	1000.0 FT.	180 KNOTS	110.1	100.4
DC-8-61	JT3D-3B	16000.0 LBS	1000.0 FT.		DATA NOT AVAILABLE	
DC-8-61	JT3D-3B	14000.0 LBS	1500.0 FT.	180 KNOTS	105.2	94.6

TABLE H-2
D3AA COMPUTER PROGRAM LISTING


```
C     FAA NOISE PROGRAM
C
C
C     THE CODE NUMBERS FOR THE 6 AIRCRAFT INCLUDED IN THIS PROGRAM ARE
C     LISTED BELOW
C      MODEL      ENGINE     CODE NO.
C     DC-8-61     JT3D-3B       1
C     DC-8-63     JT3D-7        2
C     DC-9-30     JT8D-7        3
C     DC-9-30     JT8D-9        4
C     DC-10-10    CF6-6D        5
C     DC-10-40    JT9D-20       6
C
C     INPUT DATA IS TO INCLUDE,AIRCRAFT CODE,RPM OR THRUST,AND ALTITUDE
C
C
      DIMENSION EPNL(24),DBA(24),POWER(8)
   10 WRITE (6,100)
  100 FORMAT (1H1,//,51X,'FAA - AIRCRAFT NOISE DEFINITION')
      WRITE (6,110)
  110 FORMAT(1H0,51X,'POWER        AIRCRAFT       AIRCRAFT      EPNL,
     1 SOUND')
      WRITE (6,120)
  120 FORMAT(1H ,24X,'MODEL',8X,'ENGINE',7X,'SETTING      ALTITUDE
     1VELOCITY      EPNDB       LEVEL-A')
      K=0
   20 K=K+1
      IF (K.GT.25) GO TO 10
      READ (5,30,END=999) MODEL,THRUST,ALT
   30 FORMAT (I2,2X,F7.1,2X,F7.1)
      GO TO(1,2,3,4,5,6),MODEL
    1 WRITE (6,201) THRUST,ALT
  201 FORMAT (1H0,23X,'DC-8-61          JT3D-3B',4X,F7.1,1X,'LBS',3X,F7.1,
     1 1X,'FT.')
      GO TO 500
    2 WRITE (6,202) THRUST,ALT
  202 FORMAT (1H0,23X,'DC-8-63          JT3D-7 ',4X,F7.1,1X,'LBS',3X,F7.1,
     1 1X,'FT.')
      GO TO 500
    3 WRITE (6,203) THRUST,ALT
  203 FORMAT (1H0,23X,'DC-9-30          JT8D-7 ',4X,F7.1,1X,'LBS',3X,F7.1,
     1 1X,'FT.')
      GO TO 500
    4 WRITE (6,204) THRUST,ALT
  204 FORMAT (1H0,23X,'DC-9-30          JT8D-9 ',4X,F7.1,1X,'LBS',3X,F7.1,
     1 1X,'FT.')
      GO TO 500
    5 WRITE (6,205) THRUST,ALT
  205 FORMAT (1H0,23X,'DC-10-10         CF6-6D ',4X,F7.1,1X,'RPM',3X,F7.1,
     1 1X,'FT.')
      GO TO 500
```

TABLE H-2
D3AA COMPUTER PROGRAM LISTING (CONTINUED)

```
    6 WRITE (6,236) THRUST,ALT
  236 FORMAT (1H0,23X,'DC-10-40        JT9D-20',4X,F7.1,1X,'RPM',3X,F7.1,
     1 1X,'FT.')
  500 CONTINUE
      INDEX=0
      GO TO (11,12,13,14,15,16), MODEL
   11 CALL JT3D3B (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
      TOVEL= 180.
      APPVEL= 155.
      IF(THRUST.GT.6000.) GO TO 800
      VTRUE = APPVEL
      GO TO 803
  800 VTRUE= TOVEL
  801 IF(THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 802
      GO TO 803
  802 CTRUE = 155. + ((THRUST-6000.)/(8000.-6000.))*(180.-155.)
      INDEX=1
  803 CONTINUE
      GO TO 501
   12 CALL JT3D7 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
      TOVEL= 190.
      APPVEL= 155.
      IF(THRUST.GT.6000.) GO TO 805
      VTRUE = APPVEL
      GO TO 808
  805 VTRUE= TOVEL
  806 IF(THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 807
      GO TO 808
  807 CTRUE = 155. + ((THRUST-6000.)/(8000.-6000.))*(190.-155.)
      INDEX=1
  808 CONTINUE
      GO TO 501
   13 CALL JT8D7 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
      TOVEL= 170.
      APPVEL= 140.
      IF(THRUST.GT.6000.) GO TO 810
      VTRUE = APPVEL
      GO TO 813
  810 VTRUE= TOVEL
  811 IF(THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 812
      GO TO 813
  812 CTRUE = 140. + ((THRUST-6000.)/(8000.-6000.))*(170.-140.)
      INDEX=1
  813 CONTINUE
      GO TO 501
   14 CALL JT8D9 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
      TOVEL= 165.
      APPVEL= 140.
      IF(THRUST.GT.6000.) GO TO 815
      VTRUE = APPVEL
      GO TO 818
  815 VTRUE= TOVEL
  816 IF(THRUST.GT.6000..AND.THRUST.LT.8000.) GO TO 817
      GO TO 818
```

TABLE H-2
D3AA COMPUTER PROGRAM LISTING (CONTINUED)

```
817 CTRUE = 160. + ((THRUST-6000.)/(8000.-6000.))*(165.-160.)
    INDEX=1
818 CONTINUE
    GO TO 501
 15 CALL CF660 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
    TOVEL= 180.
    APPVEL= 150.
    IF(THRUST.GT.2600.) GO TO 820
    VTRUE = APPVEL
    GO TO 823
820 VTRUE= TOVEL
821 IF(THRUST.GT.2600..AND.THRUST.LT.3000.) GO TO 822
    GO TO 823
822 CTRUE = 150. + ((THRUST-2600.)/(3000.-2600.))*(180.-150.)
    INDEX=1
823 CONTINUE
    GO TO 501
 16 CALL IT9020 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
    TOVEL= 200.
    APPVEL= 160.
    IF(THRUST.GT.2600.) GO TO 830
    VTRUE = APPVEL
    GO TO 833
830 VTRUE= TOVEL
831 IF(THRUST.GT.2600..AND.THRUST.LT.3000.) GO TO 832
    GO TO 833
832 CTRUE = 160. + ((THRUST-2600.)/(3000.-2600.))*(200.-160.)
    INDEX=1
833 CONTINUE
501  IF (ALT .GT. 10000..OR. ALT .LT.200) GO TO 150
     IF (THRUST .GT.POWER(NCURVE).OR. THRUST .LT. POWER(1))GO TO 150
    ITRUE = VTRUE
    I = 0
    J = 0
510 I = I + 1
    J = I + 1
    IF (THRUST .GE. POWER(I) .AND. THRUST .LE. POWER(J))GO TO 520
    GO TO 510
520 LC3 =I*3
    LC2 =LC3-1
    LC1 =LC2-1
    MC3 =J*3
    MC2 =MC3-1
    MC1 =MC2-1
    BTEPNL = EPNL(LC1)- EPNL(LC2)* ALOG10(ALT/250)-EPNL(LC3)*((ALT-250
   1)/1000)
    HIEPNL = EPNL(MC1)- EPNL(MC2)* ALOG10(ALT/250)-EPNL(MC3)*((ALT-250
   1)/1000)
    DELTA= (HIEPNL-BTEPNL) /(POWER(J)-POWER(I))
    REPNL =((THRUST - POWER(I))*DELTA+BTEPNL)
    BTDBA = DBA(LC1)-DBA(LC2)*ALOG10(ALT/250)-DBA(LC3)*((ALT-250)/1000
   1)
    HIDBA = DBA(MC1)-DBA(MC2)*ALOG10(ALT/250)-DBA(MC3)*((ALT-250)/1000)
   1)
```

TABLE H-2
D3AA COMPUTER PROGRAM LISTING (CONTINUED)

```
      UELTA = (HIDBA-KYDBA)/(POWER(J)-POWER(I))
      RDBA = ((THRUST -POWER(I))*UELTA)+BTDBA
      IF (REPNL .LT.80.0.OR.RDBA.LT.65.0) GO TO 150
      GO TO 360
  360 IF(INDEX.GT.0)GO TO 900
      GO TO 380
  900 REPNL = REPNL +(10.*ALOG10(CTRUE /TOVEL))
      GO TO 380
  150 WRITE (6,160)
  160 FORMAT (1H+,90X,'DATA NOT AVAILABLE')
      GO TO 20
  380 WRITE (6,370)ITRUE,REPNL,RDBA
  370 FORMAT(1H+,77X,I3,' KNOTS',4X,F5.1,7X,F5.1)
      GO TO 20
  999 STOP
      END
      SUBROUTINE  JT3D3B(ALT,THRUST,EPNL,DBA,POWER,NCURVE)
      DIMENSION EPN (24),DB (24),POWE (8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
C     DC-8-61
      DATA EPN/108.7966174,20.0639769,5.5053520,115.5630477,28.8556442,
     A1.5386065,118.9502338,31.4775435,.6043691,120.6885435,30.891871R,
     B.5767736,121.6137966,28.2848644,.7602853,122.2878188,25.8156411,
     C.7911068,122.6600607,23.5714405,.7274164,123.0408562,20.844218,
     D.4705645/
      DATA DB/96.812297,19.2195639,6.5240358,104.6993912,29.1028822,
     A2.3283154,107.4235931,33.1497144,.3968691,109.1974384,33.4569446,
     B.2500433,111.640136,32.1910586,.4170348,113.1178610,30.1838381,
     C.5358798,113.9489992,27.4632281,.6619359,114.5832014,22.6187261,
     D.8112748/
      NCURVE= 8
      DATA POWE  /2000.,4000.,5000.,6000.,8000.,10000.,12000.,15000./
      I=0
      K=NCURVE *3
      DO 1 I=1,K
      EPNL(I) = EPN(I)
    1 DBA(I) = DB(I)
      DO2 I=1,NCURVE
    2 POWER(I) = POWE(I)
      RETURN
      END
      SUBROUTINE JT3D7 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
C     DC-8-63
      DIMENSION EPN (24),DB (24),POWE (8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
      DATA EPN  /116.2015384,17.8508311,1.9636556,117.6400613,19.4305009
     X,1.354868
     1,118.9385383,20.3626042,.999087,120.6706822,21.3189886,.668031,
     2122.3411726,21.0191591,.5290593,122.8409945,20.3791149,.4087281,
     3123.1084992,18.7584281,.3620374/
      DATA DB  /107.7777249,23.5651919,3.817515,108.7592478,23.22105,
     13.3474734,109.2998101,22.7791267,3.1209339,110.6663154,22.6494376,
     22.7512298,112.7314942,25.7643804,1.1567588,113.7496859,25.0492832,
     3.8168379,114.0636897,22.0789925,.1358417/
```

TABLE II-2
D3AA COMPUTER PROGRAM LISTING (CONTINUED)

```
      DATA POWE   /4000.,5000.,6000.,8000.,10000.,12000.,15800./
      NCURVE = 7
      I=0
      K=NCURVE *3
      DO 1 I=1,K
      EPNL(I) = EPN(I)
    1 DBA(I) = DB(I)
      DO2 I=1,NCURVE
    2 POWER(I) = POWE(I)
      RETURN
      END
      SUBROUTINE   JT8D7(ALT,THRUST,EPNL,DBA,POWER,NCURVE)
C     DC-9-30 JT8D-7
      DIMENSION EPN (24),DB (24),POWE (8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
      DATA EPN  /107.7365805,15.2117029,5.7243363,109.1677931,16.0758876
     1,4.7582817,110.6403505,15.5547735,4.2378371,113.3739774,17.8990752
     2,2.3314882,115.9244657,18.6871147,1.3994396,119.1539035,15.7181709,
     3 1.2033763/
      DATA DB  /99.9974476,24.2954308,1.3585693,100.8723899,23.719776,
     1.9371943,101.8010088,23.176648,.7180562,104.5339605,22.6427426,
     2.3634632,107.9663487,22.1785275,.3212538,112.2530262,22.5769483,
     3.1293639/
      DATA POWE  /4000.,5000.,6000.,8000.,10000.,12000./
      NCURVE = 6
      I=0
      K=NCURVE *3
      DO 1 I=1,K
      EPNL(I) = EPN(I)
    1 DBA(I) = DB(I)
      DO2 I=1,NCURVE
    2 POWER(I) = POWE(I)
      RETURN
      END
      SUBROUTINE JT3D9 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
C     DC-9-30 JT8D-9
      DIMENSION EPN (24),DB (24),POWE (8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
      DATA EPN /106.7747823,24.5805386,1.0597675,108.8771964,23.6312537,
     11.3264455,110.7127801,22.9096420,1.0687718,111.6593222,21.1363096,
     21.2605920,112.3478178,19.0271536,1.1580915,115.3559484,17.1262407,
     31.1574715,119.0321371,15.8746634,.9620398/
      DATA DB /98.4191154,29.7874452,.2538370,100.4669835,23.8797379,
     31.1191558,101.0924615,23.6165928,.8425699,102.0018537,23.3752032,
     2.5561999,104.7864589,21.7005180,.5062093,108.5036426,21.6258370,
     3.4027588,112.2530262,22.5769483,.1293639/
      DATA POWE /2000.,4000.,5000.,6000.,8000.,10000.,12500./
      NCURVE = 7
      I=0
      K=NCURVE *3
      DO 1 I=1,K
      EPNL(I) = EPN(I)
    1 DBA(I) = DB(I)
      DO2 I=1,NCURVE
```

TABLE H-3
D3AA COMPUTER PROGRAM LISTING (CONCLUDED)

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    2 POWER(I) = POWF(I)
      RETURN
      END
      SUBROUTINE CF6GD (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
C     DC-10-10 CF6-6
      DIMENSION EPN (24),DM (24),POWF (8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
      DATA EPN  /103.7261218,18.9664005,4.0681013,107.2929061,18.0959953
     1,3.1267029,109.7162039,18.1525332,2.4748923,111.6543991,18.5025163
     2,1.6584951,112.9263759,18.1826906,.9614804/
      DATA DM  /98.6465832,21.1694174,4.2478261,100.1441998,26.1333453,
     12.2367288,101.2016676,24.9796477,2.1745128,103.5394495,24.5??631,
     21.5627329,105.7389054,24.9928879,.7198043/
      DATA POWF  /2200.,2400.,2600.,3000.,3420./
      NCURVE = 5
      I=0
      K=NCURVE *3
      DO 1 I=1,K
      EPNL(I) = EPN(I)
    1 DBA(I) = DM(I)
      DO2 I=1,NCURVE
    2 POWER(I) = POWF(I)
      RETURN
      END
      SUBROUTINE  JT9D20 (ALT,THRUST,EPNL,DBA,POWER,NCURVE)
C     DC-10-40 JT9D-20
      DIMENSION EPN (24),DM (24),POWF  (8)
      DIMENSION EPNL(24),DBA(24),POWER(8)
      DATA EPN  /106.5595563,19.6210165,2.3004363,108.7894025,19.2529155
     1,2.0595723,109.8254798,19.0605674,1.7993489,111.0344371,19.2848973
     2,1.2752513,113.5667659,18.7540695,.7925663/
      DATA DM  /95.3165871,20.7579902,.7784318,98.1349274,19.958301,
     1.7604243,99.5772533,19.8299584,.7168077,101.9740671,20.6277486,
     2.4257521,103.965??49,19.9326951,.3373154/
      DATA POWF  /2200.,2400.,2600.,3000.,3410./
      NCURVE = 5
      I=0
      K=NCURVE *3
      DO 1 I=1,K
      EPNL(I) = EPN(I)
    1 DBA(I) = DM(I)
      DO2 I=1,NCURVE
    2 POWER(I) = POWE(I)
      RETURN
      END
```

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